# C.13 – VISUAL RESOURCES

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## C.13.1 SUMMARY OF CONCLUSIONS

U.S. Bureau of Land Management (BLM) staff and California Energy Commission staff (hereafter jointly referred to as staff) have analyzed visual resource-related information pertaining to the proposed Calico Solar Project (formerly the Stirling Energy Systems Solar One Project) and conclude that both the proposed project and Avoidance of Donated Lands Alternative would substantially degrade the existing visual character and quality of the site and its surroundings, resulting in potentially significant impacts to motorists on Highway Interstate 40 and National Trails Highway/Route 66. With staff-recommended mitigation measures, these impacts could be greatly reduced, but would remain significant and unavoidable. The BLM is in the process of establishing visual resource management classifications for the proposed project and surrounding areas.

Staff concludes that under the proposed project and the Avoidance of Donated and Acquired Lands Alternative, the character and quality of some views from foreground and near-middle-ground areas of the Cady Mountains Wilderness Study Area would be adversely affected under NEPA, but the overall effect on views from the Cady Mountains Wilderness Study Area is considered to be less-than-significant under CEQA.

In general, impacts of the proposed project and the Avoidance of Donated and Acquired Lands Alternative would be essentially similar under CEQA and NEPA.

Impacts of the Reduced Acreage Alternative would be substantially less than the Proposed Project and the Avoidance of Donated Lands Alternative under NEPA, and are considered less-than-significant under CEQA.

The anticipated visual impacts of both the Calico Solar Project and the two alternatives, in combination with past and foreseeable future local projects in the immediate project viewshed, and past and foreseeable future region-wide projects in the southern California desert, are considered cumulatively considerable, potentially significant, and unavoidable under CEQA.

## C.13.2 INTRODUCTION

The following analysis evaluates potential visual impacts of the Calico Solar Project; its consistency with applicable Laws, Ordinances, Regulations and Standards (LORS); and conformance with applicable guidelines of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

In order to provide a consistent framework for the analysis, a standard visual assessment methodology developed by the California Energy Commission (Energy Commission) staff and applied to numerous siting cases in the past was employed in this study. A description of this methodology is provided in **Appendix VR-1.** The BLM and the Energy Commission have agreed that this methodology is the most appropriate for this site, as described in Section C.13.3.

As noted above, the project has been evaluated for conformance with applicable LORS. Adopted expressions of local public policy pertaining to visual resources are also given great weight in determining levels of viewer concern. In accordance with staff's procedure, conditions of certification are proposed as needed to reduce potentially significant impacts to less than significant levels, and to ensure LORS conformance, if feasible.

## C.13.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

To determine whether there is a potentially significant visual resources impact generated by a project, Energy Commission staff reviews the project using the CEQA Guidelines Appendix G Environmental Checklist pertaining to "Aesthetics." The checklist questions include the following:

A. Would the project have a substantial adverse effect on a scenic vista?

B. Would the project substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

C. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

D. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

In addition, staff evaluates potential impacts in relation to standard criteria described in detail in Appendix VR-1. Staff evaluates both the existing visible physical environmental setting, and the anticipated visual change introduced by the proposed project to the view, from representative, fixed vantage points called "Key Observation Points" (KOPs). KOPs are selected to be representative of the most characteristic and most critical viewing groups and locations from which the project would be seen. The likelihood of a visual impact exceeding Criterion C. of the CEQA Guidelines, above, is determined in this study by two fundamental factors: the susceptibility of the setting to impact as a result of its existing characteristics (reflected in its current level of visual quality, the potential visibility of the project, and the sensitivity to scenic values of its viewers); and the degree of visual change anticipated as a result of the project. These two factors are summarized respectively as *visual sensitivity* (of the setting and viewers), and *visual change* (due to the project) in the discussions below. Briefly, KOPs with high sensitivity (due to outstanding scenic quality, high levels of viewer concern, etc.) that experience high levels of visual change from a project are more likely to experience adverse impacts.

The National Environmental Policy Act (NEPA) requires that the federal government use "all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings" (42 U.S. Code 4331[b][2]).

Typically, U.S. Bureau of Land Management (BLM) evaluates visual effects of actions with the use of its Visual Resource Management (VRM) system. In this methodology BLM conducts inventories, delineating landscape units and assigning one of four visual resource inventory classes reflecting the existing scenic quality, viewer sensitivity, and distance zone to areas under its jurisdiction. These inventories are then used to assign visual resource *management* (VRM) classes to these lands. However, in the case of the area managed under the California Desert Conservation Area (CDCA) Plan (including this project), VRM classes were not assigned under that management plan. In some areas, VR inventories have been conducted within portions of the CDCA, and Interim VRM Classes have been assigned by BLM to some portions.

However, in the case of the Calico Solar Project site, no current visual inventories by BLM are available, and no Interim VRM Classes have been assigned. The BLM is currently in the process of beginning visual inventories of areas within the CDCA that have not yet been inventoried, including this site. However, the results of those studies are not anticipated within the time frame of this project application, and delineations of scenic quality rating units or visual resource inventory classes are not available. Therefore, it was agreed by Energy Commission and BLM that this analysis would be conducted using the Energy Commission's standard visual assessment methodology.

In staff's professional opinion, despite certain differences in approach and emphasis between the two methodologies, the assessment framework and impact thresholds of the Energy Commission method used in this study are substantially consistent with those typically applied by BLM under its own procedures. Staff thus considers that the conclusions of this analysis are substantially equivalent to those that would be reached by applying BLM-specific methods of visual assessment.

Staff also reviews federal, state, and local LORS and their policies or guidelines for aesthetics or preservation and protection of sensitive visual resources that may be applicable to the project site and surrounding area. These LORS include local government land use planning documents (e.g., General Plan, zoning ordinance).

Please refer to **Appendix VR-1** for a complete description of staff's visual resources evaluation criteria.

## C.13.4 PROPOSED PROJECT

## C.13.4.1 SETTING AND EXISTING CONDITIONS

### Regional Landscape

The proposed Calico Solar Project site comprises approximately 8,230 acres (12.8 square miles) of BLM land in San Bernardino County. The site is roughly 37 miles east of the town of Barstow and 17 miles east of Newberry Springs. It is adjacent to the north side of Interstate 40 (I-40) and near the historic Route 66/National Trails Highway that generally parallels I-40 on the south in this area. The site is on BLM-administered land and is largely bounded by BLM-administered land, although private tracts abut some portions of the site and a BNSF Railroad line traverses the site.

The 84,400-acre Cady Mountain Wilderness Study Area borders the site on the north and the Pisgah Area of Critical Environmental Concern (ACEC) is adjacent to the site's eastern/southeastern boundary. The Kelso Dunes Wilderness and Bristol Mountains Wilderness are approximately 10 miles east of the site. Much of the Cady Mountain WSA and all of the Pisgah ACEC would be within in the Mojave Trails National Monument proposed as part of the proposed 2010 California Desert Protection Act legislation. The proposed monument would extend from the site's east boundary to near Needles. I-40 forms the southern boundary of the site. Three miles south of I-40 is the northern boundary of a closed live-fire training area on Twentynine Palms Marine Corps Base. Also south of I-40 and immediately southwest of the project site is the Ord-Rodman Desert Wildlife Management Area (DWMA). The Rodman Mountains Wilderness is 3 miles distant, also to the southwest. The west side of the site is bounded by undesignated BLM-administered land. **Visual Resources Figure 1, Project Setting**, depicts the project site in its immediate regional context in relation to these various protected areas.

The site lies within the east-west trending Mojave Valley, a broad desert valley resting between the Cady and Bristol Mountains to the north and northeast and the Bullion, Lava Bed, Rodman, and Newberry Mountains to the south and southwest. The valley floor ranges from approximately 1,800-feet to 2,200-feet in elevation; the mountains rise to between 3,000-feet and 4,400-feet in elevation.

Native vegetation cover of the region consists of sparse, low-growing green-to-tan Mojave creosote bush scrub typical of the western Mojave Desert.

## Project Site

**Visual Resources Figures 2a, b, and c, Character Photos of Project Area**, depict views of the Calico Solar Project site and vicinity (AFC, Figures 5.13-3, -4, -5). (All figures referred to in the text may be found at the end of this section.)

The project site comprises over 8,200 acres of public land administered by the BLM. It does not include any private land. Although not part of the project, three adjacent tracts of private land are each surrounded on three sides by the proposed project. The most prominent man-made features at or near the site are I-40, which abuts the site on the south, and the BNSF Railroad traversing the site. These features, though evident, remain visually subordinate to the vast open expanse of the site and surroundings.

The site occupies a band of *bajada*s, or alluvial fans typical of the Mojave Desert landscape, which slope gently but noticeably southward toward the railroad and highway, from the feet of the prominently visible Cady Mountains immediately north of the site. The site is largely undisturbed and is currently managed by BLM as Multiple-Use Class (MUC) M (Moderate Use), except for a very small portion along the northern boundary of the project, which is classified as MUC Class L (Limited Use).

No communities lie within the project viewshed, which extends 5 miles from the site boundaries. The nearest rural residence is located about 2 miles east of the site.

## Project Visual Setting: Viewshed, and KOPs

### Project Viewshed

A feature of this desert landscape is the potential for large projects to be seen over great distances where even slightly elevated viewpoints exist, due to the large open areas of level topography and absence of intervening landscape features and screening vegetation. However, as illustrated in **Visual Resources Figure 3**, Project Viewshed, which presents a computer-generated GIS viewshed map depicting areas from which the site would be visible, the project is situated within a broadly enclosed viewshed defined by the Cady Mountains to the west, north, and east, and by Pisgah Crater, Sunshine Peak, and the Lava Bed and Rodman Mountains to the south and southwest. The site is thus largely visually isolated from the Mojave Valley to the west by topography and distance, and from the Broadwell Valley to the east by topography (SES 2008a). The project would be visible from locations throughout this contained viewshed. Intermittent views of the site extend up to 4 miles north into the Cady Mountains, and in general the project would be visible from various locations falling within a 5-mile radius, with the exception of mountainous areas to the north and east where terrain encloses views near the site boundary. As indicated in the figure, visibility within the Cady Mountains WSA is spotty and fragmented, due to rough, irregular terrain.

### KOPs: Visual Quality, Viewer Concern, and Viewer Exposure

**Visual Resources Figure 4** depicts Key Observation Points (KOPs) as well as locations from which photographs were taken to depict the general character of the site and vicinity. KOPs are used in the Energy Commission visual analysis method as the basis for evaluating potential project impacts, and represent the key sensitive viewer groups and viewing locations likely to be affected by the project.

In the Energy Commission assessment approach, KOPs are rated according to the visual quality of their setting, and an assessment of their level of viewer concern and viewer exposure. Those three primary attributes are summarized in a KOP's *overall visual sensitivity* rating, which reflects an assessment of the overall susceptibility to visual impact of the viewer group/receptors it represents. These sensitivity ratings serve as the environmental baseline against which potential project impacts, measured in terms of level of *visual change*, are evaluated.

KOPs used in this study include those used in the project AFC, which were selected for the AFC in consultation with Energy Commission staff. To minimize confusion, the numbering of viewpoints used in the AFC has been retained in this analysis.

In the following discussion, distance zone terminology is used in the context of the Energy Commission method, as follows: 'foreground' is used generically to refer to viewing distances under ½-mile; 'middle-ground' to distances between ½ and 5 miles; 'near middle-ground' refers to that portion of middle-ground under roughly one mile; and 'background' to distances over 5 miles.

KOP photos are selected to represent key sensitive viewer groups who would potentially be affected by the project. Project simulations are then imposed on these views to illustrate how the same view would appear with the project in place. In the

discussion that follows, the reader is referred to these 'before project' photos. The figure numbers referring to each KOP below thus appear out of sequence, but may be found along with all other figures, at the end of this section. In each case, the designation "**a**" after the figure number indicates the existing (before project) view from a KOP, while the second image is a simulation of the future condition, should the project be constructed as proposed.

KOP 1 is from a point along Route 66 looking generally northeast into the site across I-40. KOP 2 is a view looking south into the site, from an elevated position just inside the Cady Mountain WSA. KOP 3 is a view looking northwest toward the site from the vicinity of the nearest residence to the project. KOP 4 is a view north into the site from where the BNSF Railroad crosses under an existing electric transmission line about 800 feet from the eastern edge of the site. KOP 5 is a view from I-40 eastbound, looking east-northeast across westbound I-40 into the site.

### *Route 66/I-40 - KOP 1*

KOP 1 is taken from Route 66 (National Old Trails Highway), which parallels I-40 slightly to the south in this segment. Despite its name, this portion of old Route 66 does not have Scenic Byway or other officially designated status. It is maintained by the County and is a remnant of the original National Old Trails Highway established in the early 20th century between Maryland and California. It remains the focus of efforts to preserve and maintain it by groups interested in its historic status and associated historic features. I-40 is an eligible state scenic highway but has not been officially designated. It receives relatively high levels of traffic (15,600 vehicles per day) (AFC 5.13-5) (SES 2008a). The KOP is fairly representative of motorists on both of these roadways, though it differs from typical views from I-40 in that the project is seen from Route 66 at a greater distance. **Visual Resources Figure 8a** depicts the existing view from KOP 1. The project would begin beyond I-40, seen in the foreground, directly across the median from this vantage point. As depicted in this photograph, views of the site from Route 66 would generally have I-40 and low-voltage utility lines in the immediate foreground. The landscape beyond is relatively featureless, characterized by large expanses of gently sloping fan or *bajada* topography, dissected by intermittent seasonal washes. Land cover is low-growing, nondescript bush scrub (primarily Mojave Desert creosote bush scrub) that is naturally sparse, lending a brown to green hue to the lighter tan colored soil surface. Beyond the highway and middle-ground bajada, the Cady Mountains, a Wilderness Study Area, dominate the background.

Visual Quality: Visual quality of this landscape is considered moderate. Although some visually compromising elements (including the highway, low-voltage utility lines, the BNSF rail line, and disturbance from a pipeline right-of-way) are present, these remain visually subordinate and the bajadas comprising the project site, descending from the intact and visually vivid Cady Mountains nearby, appear predominantly undisturbed and intact. The typical bajada landscape is common in the region and relatively featureless, but provides a characteristic and fairly undisturbed foreground to the rugged nearby mountains.

Viewer Concern: Viewer concern is considered moderately high; the focus of many Route 66/Historic Trails Highway users would be on the historic nature of this roadway and the encompassing landscape through which earlier travelers would have

experienced. In this context, the integrity of the view would be of high importance. Similarly, the I-40's state-eligible scenic status contributes to a higher level of viewer concern.

Viewer Exposure: Viewer exposure is high. Views of the site, which adjoins I-40, are unobstructed. The sloping of the site's fan topography, which ranges from 1,800 feet in elevation in the southern portion of the project site to approximately 2,200 feet in elevation in the northern portion of the project site, is oriented to the highway, increasing its overall exposure.

Overall visual sensitivity was thus considered to be moderately high.

***Cady Mountains WSA – KOP 2***

**Visual Resources Figure 9a** depicts the existing view from KOP 2 looking south across the project area. It provides a view of the project site from within the Cady Mountains WSA, as viewed from approximately 1,500 feet from the northern boundary of the site and somewhat elevated above the site. The WSA occupies the high ground above the project site on the north. The immediate foreground is dominated by sparse vegetation, cobbles, and the smaller landforms on the lower slopes of the Cady Mountains. Views of level open desert terrain characterized by light tan colored soils and sparse scrub vegetation occupy the visual middle-ground. The BNSF Railroad, approximately 3 miles away, and I-40, which is approximately 5 miles distant, create linear elements crossing the middle-ground, but are visually subordinate in the broad landscape. The ridges of the Rodman and Lava Bed Mountains are 12 to 14 miles away and dominate the background.

Visual Quality: While man-made intrusions and ground disturbance remain visually subordinate within the relatively intact natural landscape, landforms and vegetation of the site lack exceptional vividness. Visual quality is enhanced by the high skyline of the Lava Bed and Ordman Mountains in the distance and the panoramic views of the valley floor, with Pisgah Crater and unusual, contrasting lava features visible in the middleground The visual foreground from this area, though not depicted in this particular view, would also be characterized by visually interesting contrasting patterns of rugged outcrops and ridges, and alluvial washes. Visual quality from this KOP was characterized as moderately high.

Viewer Concern: Viewer concern from this KOP is considered moderately high – wilderness areas generally would be considered to have high sensitivity, but the number of visitors at this distance to the project is believed to be very low.

Viewer Exposure: Viewer exposure at this distance is moderate; while open and unobstructed views are present within the WSA to background distances, as indicated in the viewshed map depicted in **Visual Resources Figure 3**, visibility is intermittent, often obstructed by intervening rock outcrops in the very rough terrain, characterized by highly irregular rocky peaks and ridges separated by lower alluvial washes. In addition, increasing viewing distance diminishes visibility and prominence of the project and the background mountains are a dominant feature in all southward views. Finally, viewer

numbers are believed to be very low because of the remoteness and difficulty of the location, although the area has experienced increasing OHV activity in recent years.

Overall visual sensitivity is considered to be moderately high.

### *Eastside View – KOP 3*

KOP 3 is a view from the nearest residence to the proposed project site. **Visual Resources Figure 10a** depicts the existing view from this location. The project's eastern boundary would be at the existing transmission line visible in the middle-ground at a distance of approximately 1-1/2 mile. This KOP is at approximately the same elevation as much of the project site. As with most of the KOPs, views of level, relatively featureless open desert characterized by light tan colored soils and sparse scrub vegetation occupy the visual foreground and middle-ground. The existing transmission line, visible at a distance of about 1-1/2 miles, detracts from the intactness of the landscape setting, but remains visually subordinate at this distance. Ridges of the westernmost Cady Mountains are visible at a distance of roughly 9 miles; the taller, distant Calico Mountains can be seen on the horizon at background distances of 25 miles or more.

Visual Quality: Visual quality is moderate. The level, open fore- and middle-ground is typified by characteristic non-descript creosote scrub vegetation, with moderate levels of existing visual intrusion by existing transmission lines. The existing power line, an existing electric substation, the BNSF Railroad, and I-40, which are approximately one mile south and west of this point, intrude into views from this location and detract from their intactness. The openness of the landscape, and the background mountain ridges are the principal distinctive features.

Viewer Concern: Viewer concern is considered moderately low due to the absence of other similar viewers. This residence may the only one within the project viewshed and is not representative of a typical viewer group.

Viewer Exposure: Views within this landscape are open and largely unobstructed; however, viewer exposure to the project is considered moderate. The project would occupy the level middle-ground at a similar elevation as the viewpoint, thereby occupying a narrow portion of the overall field of view due to the oblique viewing angle. This narrow band thus tends to be dominated by the foreground, which has variety in color and texture, and the background ridges, which break the horizon and dominate attention. This moderation of exposure due to oblique viewing angle is somewhat off-set however by the vast horizontal extent of the project from viewpoints at this distance, and high contrast of anticipated mirror brightness under many typical conditions.

Overall visual sensitivity of this KOP is thus considered to be moderate.

### *BNSF Railroad/I-40 West – KOP 4*

**Visual Resources Figure 11a** depicts the view from the BNSF rail line, looking northwest into the project's eastern boundary at a distance of roughly 800 feet. KOP 4 was included in the AFC analysis because the AMTRAK Southwest Chief route from Los Angeles to Chicago travels on the BNSF rail line through the middle of the project

site. However, the Southwest Chief passenger train travels through the site only at night in both directions. For that reason, train passengers are not considered to be a potentially sensitive viewer group within the project viewshed, and will not be analyzed further in this discussion.

However, KOP 4 closely resembles viewing conditions of I-40 motorists in close proximity to the project boundaries and, particularly, the SunCatcher units, as they could be along much of the I-40 project frontage, and as they would be at the project's eastern boundary a short distance (approximately ½-mile) to the south of this viewpoint. Particularly because the simulation of this viewpoint is very useful in visualizing the potential effects of the project on motorists when seen at close distance, this KOP has been retained in this discussion to address effects on that viewer group.

Because the KOP is being discussed in relation to viewing conditions on I-40, the setting/sensitivity discussion applicable to this KOP is essentially the same as that under KOP 5, below.

***Interstate 40 East – KOP 5***

KOP 5 is a view northeastward from eastbound I-40 across the opposite lanes of I-40. **Visual Resources Figure 12a** depicts the existing view from KOP 5. The view is similar to that from KOP 1, also facing northeastward. The visual foreground consists of the median of the highway and opposite westbound lanes and the utility poles along the highway.

Visual Quality: Visual quality is moderate. The middleground consists of the relatively intact, sloping bajadas descending from the Cady Mountains, characterized by light tan soils and sparse scrub vegetation. The alignment of the BNSF Railroad forms a relatively inconspicuous linear element across the near-middleground. Hills and ridges of the Cady and Bristol Mountains at middleground distance are vivid features, with interesting patterns of contrast between dark, rugged rock outcrops and ridges against lighter–colored strata and alluvial washes. At this middleground distance, the mountains enclose and dominate the view, strongly enhancing an otherwise fairly featureless landscape, elevating visual quality for eastbound travelers.

Viewer Concern: Viewer concern is considered moderately high, due to an elevated level of concern with scenic values presumed within the CDCA in general, and a relatively high proportion of motorists on I-40 concerned with those scenic values.

Viewer Exposure: Viewer exposure is high; views are predominantly open and unobstructed over an extensive area, and the project site is viewed at foreground and middle-ground distance, with terrain sloping downward toward the viewer along a highway frontage of roughly 4 miles. The view from KOP 5 is of the project site seen at a distance of a little over 1 mile across a privately held tract of land not in the project. Viewer numbers on I-40 are relatively high (15,600 vehicles per day) (cite: AFC 5.13-5).

Overall visual sensitivity of this KOP is thus considered to be moderately high.

## C.13.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

**Significance Criteria**

The following regulatory criteria were considered in determining whether a visual impact would be significant.

### Federal

Significance under NEPA is defined in terms of a) context and b) intensity. Context means that the significance of an action must be analyzed in several circumstances or situations, such as society, the affected region, affected interests, and locale. Intensity refers to the severity of impact, and includes a variety factors to be considered (40 CFR 1508.27).

Some of the intensity factors potentially relevant to visual impacts include 'unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands . . . ,' degree of controversy, degree of uncertainty about possible effects, degree to which an action may establish a precedent for future actions, and potential for cumulatively significant impacts.

### State

The CEQA *Guidelines* define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance." (Cal. Code Regs., tit.14, § 15382.) Appendix G of the *Guidelines*, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

### Local

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable **Laws, Ordinances,Regulations, and Standards (LORS)**.

## Project Visual Description

### Power Plant

**Visual Resources Figure 5** depicts the layout of the two proposed project phases. **Visual Resources Figure 6** depicts architectural elevations of the Calico Solar Project Main Services Complex, (AFC). **Visual Resources Figure 7** depicts elevations of the proposed mirrored solar dish units (Data Response #125) (SES 2009p).

The proposed project includes approximately 34,000, 38-foot solar dish Stirling systems (i.e., SunCatchers) and associated equipment and infrastructure within a fenced boundary, occupying approximately 8,230 acres (roughly 12.8 square miles) of undeveloped land. Associated proposed facilities on the site include:

- Main Services Complex located generally in the center of the site for administration and maintenance activities, which would include buildings up to 78 feet in height, parking and access roads;
- Staging Area adjacent to the Main Services Complex for use during construction
- Staging Area adjacent to the eastern site boundary, near the existing power line and railroad
- 220 kV Substation located generally in the center of the site, south of the Main Services Complex.

### Site Layout

A specific detailed site layout of the SunCatcher units is not provided in the AFC. However, large-scale schematic layouts such as AFC Figure 3-4 suggest that the rows of SunCatchers under Phase 2 could abut the Highway I-40 right-of-way in the western portions of the project. AFC Figure 3-4 also suggests that in the eastern portion of the I-40 frontage, the southernmost SunCatchers would be located immediately north of the existing pipeline right-of-way (SES 2008a).

### Construction Staging Area

Four construction staging/lay-down areas are proposed. Two 26-acre laydown areas will be placed at the south entrance off Hector Road and I-40, and the east entrance north of the Pisgah Substation, respectively. A 14-acre laydown area will be provided adjacent to the Main Services Complex. A 6-acre laydown area will be provided adjacent to the Satellite Services Complex.

### Site Grading

Site grading would potentially represent a significant visual component of the proposed project during construction. Surface disturbance of the proposed site, as in most desert landscapes of the region, can often result in high contrast between the disturbed area and surroundings, due to high contrast between the disturbed soil color and solar reflection (albedo), and the color and albedo of the existing undisturbed, vegetated surface. Furthermore, effectiveness of revegetation in this arid environment is difficult, of limited effectiveness, and capable of recovery only over a very long-term time frame.

### Plant Night Lighting

According to the AFC, night lighting of the Main Services Complex would consist of 400-watt high-pressure sodium lights, with illumination falling to 0.0 foot-candles on the ground a short distance from the facility (AFC, Figure 3-20, -21)(SES 2008a).

Parking and roadway lighting would consist of full cut-off luminaires to minimize night sky light pollution. Preliminary photometric studies provided in the AFC depict illumination from these fixtures falling to 0.0 foot-candles a short distance from each roadway intersection (AFC Figure 3-23) (SES 2008a).

### Linear Facilities

- a 1.7-mile 730-MW/220-kV transmission line intended to connect to the existing Southern California Edison (SCE) Pisgah Substation located at the southeast boundary of the project site
- three overhead 34.5 kV collection circuits to convey power to the substation within the project. The height and length of these lines is not described in the AFC, but are visible in some of the AFC visual simulations
- approximately 38 miles of paved roads, approximately 587 miles of unpaved access roads.

## Visual Impact Assessment

### Staff Discussion of AFC Analysis

Despite various differences in methodology and specific conclusions, staff is in general agreement with the overall conclusions of the applicant's AFC visual analysis. That is, the AFC concluded that potential project visual impacts from KOPs 1, 2, 4, and 5 are potentially significant. The visual impact assessment below provides staff's independent analysis of visual resource impacts, and includes staff comments on the applicant's AFC visual analysis where appropriate. Visual simulations provided in the AFC are utilized to support or complement staff's analysis. The KOP analysis below is staff's own.

### Direct Project Impacts

#### *Project Operation Impacts*

Impacts of Structures on Key Observation Points

*KOP 1 – Route 66/I-40.* ***Visual Resources Figures 8A and 8B.***

As described in Section C.13.4.1, above, overall visual sensitivity of this KOP, and much of the viewshed generally, is considered to be moderately high. Overall, existing scenic quality of this landscape is considered moderate. However, viewer concern is considered moderately high; the focus of many Route 66/National Trails Highway users would be on the historic nature of this roadway and the encompassing landscape which

earlier travelers would have experienced. Viewer concern is also elevated by the I-40's state eligible scenic highway status. Viewer exposure is high.
Staff also notes that internal project transmission lines, depicted in the other simulations, are not included in the applicant's simulation of KOP 1. These features would add a contrasting vertical visual element that would detract somewhat from the visual unity of the mirror field and contribute to a more industrial overall visual character.

According to information provided in Data Response #124 (SES 2009p), the project condition depicted in the simulation of KOP 1 contradicts the layout indicated in the AFC project description as shown in AFC Figure 3-2 (SES 2008a). It does, however, correspond roughly to the assumption that SunCatchers would be located only north of the existing pipeline right-of-way. As discussed further, below, these differences are critical to the accuracy of both the simulated view, and the impact analyses presented in this study.

**Figures 8A and 8B** depict a view northward from Route 66 (National Trail Highway), at a foreground distance of less than 1,000 feet to the site. However, as discussed further below, the nearest SunCatcher units depicted in this simulation are located over 1,700 feet away. Staff considers this to be a reasonably representative viewpoint. The range of actual view of the project would extend from foreground, throughout the middle-ground, to the background 5-miles distant. The project would appear very prominent, dominating the view from foreground locations on Route 66 and I-40. From such viewpoints near the project site, the project would strongly dominate the vista.

Project visual contrast would be very strong. Texture and form contrast with the existing landscape of the vast rows of SunCatchers at this distance would be strong, lending a distinctly man-made, industrial character to the location. Color contrast with the existing natural environment would also be strong, and although the field could at times resemble a vast lake surface, reflecting the sky, at other times the mirrors are expected to appear very bright, to the point of representing a strong nuisance or distraction, though not a hazard to navigation. In addition, the long, linear, bright SunCatcher rows, which are oriented perpendicularly to the highway, would rapidly alternate with the darker-colored land between each row, introducing a large-scale flickering effect at the highway frontage that would compound the nuisance and distraction of glare for some viewers. From some viewpoints, the taller buildings of the Main Services Complex (up to 77 feet tall) could be visible in the middle of the site, exhibiting some vertical form and line contrast and attracting attention, although at this distance they appear relatively inconspicuous. Likewise, poles for the electric collection system, though not depicted in the simulation of KOP 1, would be visible throughout the site and introduce vertical and horizontal elements of visual complexity that would detract from the visual unity of the scene and add to the overall industrial character. However, these features generally would be dwarfed by the vast scale and dominance of the SunCatcher fields.

The project would exert extraordinary horizontal scale and spatial dominance, occupying a vast expanse of the landscape along nearly 5 miles of highway frontage, not including the view when approaching the project on the highway. As depicted in the simulation, the overall proportion of the view occupied by the project would be extensive compared to the foreground terrain, background mountains, and sky, due to the sloping terrain and resulting site exposure.

As depicted in the simulation of KOP 1, the project does not physically block scenic views of the Cady Mountains in the distance from viewpoints along the highway. This feature of the simulation is discussed further, below. Overall visual change to viewers from Route 66 is considered high. The project would demand attention, could not be overlooked, and would be dominant in the landscape.

Impact Significance - In the context of moderately high overall visual sensitivity, the high level of visual change experienced by the majority of Route 66 and I-40 viewers – those within foreground and near-middle-ground distance from the project – would be regarded as significant.

As depicted in the applicant's simulation of KOP 1, the SunCatchers would not physically block scenic views of the Cady Mountains in the distance. Because the SunCatcher units are approximately 38 feet in height, this appears somewhat counter-intuitive. According to information provided in Data Response #124, this phenomenon would occur in large portions of the highway frontage, apparently for two principal reasons: first, Highway I-40 is elevated up to 8 feet above the adjacent plain, and up to 20 feet above the elevation of the nearest simulated SunCatchers, based on assumed siting depicted in the simulations. Elevation of the plain adjoining the highway continues to decline in relation to the highway until the BNSF rail line, over 1 mile from the highway, which generally represents a low point. Second, the simulations depict the site boundary as at least *1,200 feet from the edge of the roadway*, and the nearest SunCatchers set back an additional 500 feet from the site boundary. In the simulation of KOP 1, as depicted in the AFC, the nearest SunCatchers are thus assumed to be at least 1,700 feet from the edge of the roadway and 2,634 feet from the camera viewpoint on Route 66. The drop-off in elevation from the road at that set-back distance apparently accounts for the fact that the SunCatchers do not block views of the mountains behind them, as well as for the diminished visual scale and height of the units within the view, and the fact that the entire field to background distance remains visible Data Response Set 1 Part 2 # 124) (SES 2009p). The siting assumptions depicted in the simulation of KOP 1 and Data Response 124 thus contradict those depicted in AFC Project Description Figure 3-2. They do, however, appear to correspond roughly to the assumption that the project perimeter fencing and SunCatchers would be located *only north of the existing pipeline right-of-way*.

These discrepancies are relevant to this discussion because staff believes that the visual conditions as seen by motorists on I-40 and Route 66 would differ substantially under the siting assumptions presented in AFC Figure 3-2 and in Data Response #124, respectively. Under the assumptions depicted in AFC Figure 3-2, SunCatchers would be sited south of the pipeline ROW within a short distance of the highway. Under those conditions, the mirror units would not only have considerably greater visual magnitude individually, but would be higher in relation to the roadway and would begin to block views of the mountains in the background. At sufficiently close distance, they could completely enclose northward views from the highway. Closer siting would also exacerbate potential nuisance glare effects on motorists, which would be reduced by distance.

However, with the siting assumptions embodied in the simulation of KOP 1 and depicted in Data Response #124 – i.e., setbacks from the roadway to the nearest SunCatchers of

1,700 feet or more – the potential visual effects to motorists would be substantially reduced when compared to potential effects of the project with a much smaller set-back. Potential glare effects, visual scale of the units, and potential view blockage would all be substantially reduced. For these reasons, staff endorses the siting assumptions represented in the simulation of KOP 1, and recommends adoption of a similar approach as part of **Condition of Certification VIS-3**.

Mitigation – Staff recommends **Condition of Certification VIS-3, Set-Back of SunCatchers from Highway I-40**, which proposes siting of the SunCatchers to the north of the existing pipeline ROW, with a minimum set-back of the SunCatchers from the highway of 500 feet.

With this measure, as depicted in the simulation, project effects would remain substantial and continue to dominate the landscape. However, they would be considerably less than a project without these set-backs, retaining views of mountains and reducing potential nuisance glare impacts.

In addition, in order to reduce the contrast of non-mirror project features as seen from all off-site viewpoints, **Condition of Certification VIS-1, Surface Treatment of Non-Mirror Project Structures** is recommended.

With these measures, visual contrast and dominance of the project would be considerably reduced. However, visual contrast and dominance of the projects would remain strong, and impacts would remain significant.

Staff discussion of landscape screening measures: In the AFC, the applicant has suggested possible landscape screening measures as a potential mitigation measure to address project visual impacts. Staff has not recommended landscape screening measures, for the following reasons:

a) the amount of water that would be needed in this desert landscape to make such screening viable would be very substantial, and it is unclear that the resulting screening would represent a visual mitigation commensurate with its high social, monetary, and environmental cost.

b) any such screening would be nearly as out-of-character with the existing native landscape of the Mojave Desert as the project itself. Although many people may indeed prefer tree rows or other tall vegetation to the view of mechanical devices, the degree of visual change from the native landscape of miles of tall, non-native vegetation would be nearly as high as from the proposed project.

*KOP 2 - Cady Mountains WSA.* ***Visual Resources Figures 9A and 9B.***

KOP 2 represents a view of the project site from within the Cady Mountains WSA, as viewed from slightly over ¼-mile from the northern boundary of the site, at an elevation of roughly 300 feet above the base of the nearest SunCatchers, and 500 feet above the BNSF rail line visible in the view.

The location of the KOP as indicated in AFC Figure 5.13-2 may be inaccurate, or the accompanying information for the KOP may be inaccurate. According to Figure 5.13.6,

the viewpoint faces into a portion of the project area that is ‘not a part’ (NAP) of the project. In Figure 5.13-14, the simulated view is described as a ‘worst-case view.’

However, if the mapped KOP location is correct and the ‘notch’ in the SunCatcher layout visible toward the center of the simulation represents the southwestern corner of the southern excluded (‘not a part of project ‘ (NAP)) area (Section 01, T09N R05E), then far from being a ‘worst case’ view from the Cady Mountains, this view would represent a ‘least case’ view, depicting roughly an area of less than two sections of units at a nearest distance of roughly 2.4 miles. The nearest depicted SunCatchers would thus be those at the northern edge of the large NAP area roughly ½ mile north of the BNSF rail line (Section 12). However, if this interpretation is correct, then the KOP location map clearly indicates that a slight rotation to the left from this or a similar nearby viewpoint within the Cady Mountains would potentially reveal an area of over 8 sections of units, at a closest distance of roughly 1,500 feet or .28 mile. Obviously, if this interpretation is correct, the visual effect of such a view (i.e., directed over the totality of the eastern portions of the project from an elevated position) would be dramatically greater than depicted in this simulation.

The simulation from Cady Mountain is accurately representative in one sense. According to the viewshed mapping depicted in **Visual Resources Figure 3**, visibility of the plain below from the south face of Cady Mountain is highly spotty and fragmented, due to the very rough terrain, so that views may often be hidden by intervening rocky topography, while nearby high points would have clear panoramic views.

As represented in the simulation from KOP 2, project contrast at this distance would generally be moderate. Color and texture contrast with the existing landscape at this distance would be strong, lending a conspicuous, distinctly man-made character to the view. Form and line contrast, however, would be relatively weak, blending with the broad horizontal lines of the level terrain.

In general, at this distance the project would exert strong horizontal scale and spatial dominance, occupying a vast extent of the landscape. Due to the viewshed characteristics in the Cady Mountains described above, however, visual dominance would vary considerably, as a function of visual exposure due to terrain. In the most exposed conditions, for example in the areas north of the proposed project area, viewers could overlook a panorama of up to 8 square miles of SunCatchers or 4 times the area depicted in the simulation, with the nearest of these seen at foreground distance. From such viewpoints, project dominance would be very strong, occupying the largest part of the overall view and overshadowing all other elements. In other cases, as in the simulated view, where the preponderance of the project is hidden by terrain, contrast and dominance could be moderate, and the project would appear to be visually co-dominant with the background mountains.

The project would not block scenic views, occupying the visual foreground of the background mountains, although it would block view of the natural valley floor.

Visual change from KOP 2 and similar middle-ground viewpoints would thus range from moderate to strong depending on location and distance. However, according to viewshed mapping, from the majority of locations at distances approaching a mile or

more, visual exposure would decline due to intervening terrain, as would visual dominance due to distance. In view of the very scattered and intermittent visibility of the project predicted by viewshed mapping within the one- and 2-mile distance zones, the relatively low levels of visitation, the small proportion of the WSA that would be affected, and correspondingly limited view durations, overall visual change from the Cady Mountains is considered to be moderate.

Impact Significance - In the context of moderately high overall visual sensitivity, the moderate level of visual change experienced by visitors to Cady Mountains WSA at distances of over roughly one mile would be somewhat adverse. However, in view of the small proportion of the Cady Mountains WSA potentially affected at closer distances, overall impacts to viewers in the WSA are considered to be less than significant.

Mitigation – No mitigation measures are considered necessary at distances of over roughly one mile. No measures are available for nearer viewpoints. Those nearer viewpoints are sufficiently intermittent and represent so small a proportion of the WSA, however, as not to require mitigation.

*KOP 3 - Eastside View,* ***Visual Resources Figures 10A and 10B.***

KOP 3 represents the view from the nearest residence to the project, situated approximately 1.5 miles to the east of the site. As noted in Section C.13.4.1, above, this viewpoint may be the only residence within the project viewshed and may thus be unique, and not representative of a larger viewer group. It is, however, informative of the appearance of the project at this distance. In staff's opinion, however, the simulation does not accurately convey the level of brightness expected from the face of the mirrors under typical conditions.

As illustrated in the simulation, at this distance the existing SCE 500 kV and 230 kV transmission line towers and poles are evident, though visually subordinate within the view. The line and towers do not intrude into the skyline due to the mountains in the background. The project would begin at the transmission line and extend away from the viewer. However, numerous towers and poles required by the project internal to the site would increase the degree of vertical form and line contrast with the horizontal landscape. The contrast of the combined transmission lines could attract attention and begin to dominate the characteristic landscape. Due to the relatively level grade/elevation relationship between the project and viewpoint, at this distance the project occupies a narrow portion of the overall field of view due to the oblique viewing angle. The reduced dominance due to oblique viewing angle is somewhat off-set however by the vast horizontal extent of the project from viewpoints at this distance, resulting in high spatial dominance; and by high contrast of anticipated mirror brightness under many extended, typical conditions. Although not obstructing views of the distant background, the extensive array of regularly spaced solar units along the project boundary would completely dominate the middle-ground. Accounting for the anticipated brightness of the mirror field for extended periods, and the strong horizontal spatial dominance of the project, overall visual change at this distance would be strong. The project would demand attention, could not be overlooked, and would be dominant in the landscape.

Impact Significance - In the context of moderate overall visual sensitivity from this and similar locations, due to low visual magnitude and very low viewer numbers, the moderately high level of anticipated visual change of the project is considered adverse but less than significant.

Mitigation – No mitigation measures are considered necessary from KOP 3

*KOP 4 - BNSF Railroad/I-40 West. -* ***Visual Resources Figures 11A*** *and* ***11B.***

As discussed in Section C.13.4.1, above, Amtrak passengers on the BNSF rail line were determined not to be sensitive receptors. However, KOP 4 is retained to help convey the appearance of the project at foreground distance from similar viewpoints on I-40.

According to the photo location depicted in the AFC, the camera position is very roughly 700 - 800 feet from the project boundary. When compared to other simulations in which the SunCatchers are located at distances of ½ mile or more, the difference in level of impact as a function of distance is apparent. In addition, KOP 4 illustrates the effect of foreground views where grade relationships are relatively level. In such situations, the mirror units are likely to block and enclose views, as suggested by the simulation.

For most of the frontage of the project, I-40 is elevated in relation to the adjoining ground. However, that amount of elevation is not sufficient by itself to prevent the 38-foot-tall mirror units from blocking views and being highly dominant. Based on USGS topographic maps, however, elevations of the adjoining plain northward from the road edge tend to decrease along much of the highway frontage until the point of the BNSF rail line, which generally represents a low point. Thus, as indicated in simulations of KOP 1, above, and KOP 5, below, sufficient set-backs from the highway are a critical factor in reducing the visual height and magnitude of the mirror units, and for preventing view blockage or enclosure from the highway by the mirror units. Consequently, staff recommends **Condition of Certification VIS-3,** which proposes siting of the SunCatchers to the north of the existing pipeline ROW, with a minimum set-back of the SunCatchers from the highway of 500 feet.

*KOP 5 – Interstate 40 Eastbound,* ***Visual Resources Figures 12A and 12B.***

Staff Comments on Applicant's Simulation

KOP 5 represents near-middleground views of the project by motorists on I-40 eastbound. Because this view looks across foreground that is not a part of the project, it is not fully representative of what a viewer would experience while travelling on I-40, but depicts views along the roughly 1 mile section of excluded highway frontage. The viewpoint appears from the applicant's KOP map to be roughly 1 mile from the site. The simulation of KOP 5 primarily depicts the south-easternmost corner of project Phase 2, covering an area of roughly two sections (square miles).

At this set-back distance, the contrast and dominance of the project is substantially reduced when compared to KOP 1 and, especially, to KOP 4. Similarly, the spatial dominance of the project appears much less than in KOP 1 because the area depicted is considerably smaller. Based solely on this image one could conclude that the project could appear co-dominant with the surrounding landscape.

However, in order to fully understand the visual effect of the project from this or other viewpoints on I-40, it is important to recall that for approximately 5 miles the project fronts on I-40. In addition, the project would be visible for roughly 3 miles to the east of the project and for roughly 5 miles to the west of the project, particularly during morning and afternoon hours when diffuse reflection could be strongest. (KOP 3 depicts the appearance of the project from a distance of roughly 2 miles). The view in the KOP 5 simulation represents the greatest distance between the highway and the project at any point in the 5 miles of frontage. Over 80% of the frontage on I-40 could be as little as a few yards from the highway right-of-way. Thus, in staff's opinion, a closer approximation of the I-40 experience is provided in KOPs 1 and 4, although as discussed, this would only be true assuming adoption of recommended **Condition of Certification VIS-3**. Without that measure, the project could potentially appear more prominent than depicted in KOP 4 for a considerable portion of the I-40 frontage, because it could be located at a closer distance. Similarly, although spatial dominance of the project in this image appears moderate, a rotation to the left from this same viewpoint would depict a view of most of the 8 square miles of the proposed project behind the BNSF rail line, where the project would extend to its highest elevations at the foot of the Cady Mountains (up to an elevation of approximately 2,200 feet). At that angle, or in views from locations throughout the I-40 frontage directed toward the project, the view would resemble the simulation of KOP 1. Although the simulation is not necessarily inaccurate, staff also understands that the diffuse reflective brightness of the mirror fields could be substantially greater than depicted in this view for a substantial proportion of the day, increasing overall contrast accordingly.

Staff Analysis

For the reasons cited above, staff considers the simulations of KOPs 1 and 4 to be more representative of the I-40 motorist's experience than KOP 5, and together, more representative of the salient aspects of the project's visual characteristics. That is, with sufficient set-backs from the highway, most views from I-40 would resemble KOP 1, exposing the vast area of the mirror fields due to the sloping topography and exhibiting a highly unusual level of character contrast and spatial dominance. Without sufficient set-backs from the highway, the project would resemble the simulation of KOP 4. That is, visual height and magnitude of the individual SunCatchers would be great, collective diffuse glare could be strong, and there would be a potential for scenic view blockage and enclosure by the tall mirror units. Consequently, staff's analysis of impacts to motorists on I-40 (and Route 66) is as discussed under KOPs 1 and 4. KOP 5 provides useful supplemental understanding of the NAP portion of the highway frontage, but is atypical and does not alter staff's conclusions on the overall project effects to motorists. That is, overall visual change to viewers from Route 66 is considered high. The project would demand attention, could not be overlooked, and would be dominant in the landscape.

Impact Significance - In the context of moderately high overall visual sensitivity, the high level of visual change experienced by the majority of Route 66 and I-40 viewers – those within foreground and near-middle-ground distance from the project – would be regarded as significant.

### *Project Construction Impacts*

In addition to the proposed project site, four construction staging/lay-down areas are proposed. Two 26-acre laydown areas will be placed at the south entrance off Hector Road and the east entrance north of the Pisgah Substation, respectively. A 14-acre laydown area will be provided adjacent to the Main Services Complex. A 6-acre laydown area will be provided adjacent to the Satellite Services Complex.

The two 26-acre lay-down sites would be of substantial scale. Both would be visible from I-40. However, only the eastern site at Hector Road would be prominent to motorists. The other two smaller sites would be visually inconspicuous. The eastern 26-acre site would be located along the highway frontage and thus be highly visible for a length of approximately ¼-mile. This exposure could result in unsightly effects for the duration of construction, and in long-term effects if soil and vegetation disturbance were not mitigated. In order to minimize short- and long-term impacts of this staging site to motorists on I-40, staff recommends **Condition of Certification VIS-4.** With this recommended measure, impacts of the staging site would be reduced to less-than-significant levels.

### Indirect Impacts

The proposed Calico project is sited within a limited and largely enclosed viewshed in which there are few other likely sites for solar energy development. In addition, the site is largely surrounded by various protected areas. However, the likelihood of implementation of a proposed SES Solar 3 project immediately to the northwest, adjacent to the Calico Solar Project, seems high if the proposed project is approved. The potential cumulative impacts of the combined projects are discussed under Section C.13.9, below. Potential indirect impacts from proposed 275 MW Early Interconnection and 850 MW Full Build-Out options are discussed below in Section C.13.8.

### Closure and Decommissioning Impacts and Mitigation

Permanent closures would require the applicant to submit to the Energy Commission a contingency plan or a decommissioning plan. A decommissioning plan would be implemented to ensure compliance with applicable LORS, removal of equipment and shutdown procedures, site restoration, potential decommissioning alternatives, and the costs and source of funds associated with decommissioning activities.

The removal of the existing facility would leave a very prominent visual impact over the entire site due to color contrast created between graded or disturbed soil areas and undisturbed areas in the region of the project site. This color contrast is due particularly to the dark color element contributed by normal scrub vegetation, and the light color of underlying soils in the area. At present, despite some surface disturbance from the railroad and utility rights of way, the site retains a predominantly natural character. However, unlike these rights-of-way, the disturbed area of the site would be highly visible to motorists traveling on 1-40 and Route 66. Revegetation of areas in this desert region is difficult, but has been implemented with success in some cases over time. Thus, visual recovery from land disturbance after closure and decommissioning could take place, although only over a long period of time, with implementation of an active and comprehensive revegetation program for the site. With Condition of Certification BIO-10 in the Biological Resources section of this SA/DEIS, visual recovery could be

accomplished and impacts would be reduced to less-than-significant levels in the long term.

### C.13.4.3 CEQA LEVEL OF SIGNIFICANCE AND ADVERSE EFFECTS UNDER NEPA

The BLM is in the process of establishing visual resource management classifications for the proposed project and surrounding areas.

Appendix G of the CEQA Guidelines includes four significance criteria for evaluating aesthetic impacts, as follows:

**A. Would the project have a substantial adverse effect on a scenic vista?**

No specific designated scenic vista locations were identified in the project viewshed. However, as described above, a higher level of viewer concern for scenic values was associated with the project viewshed as seen from the highway due to the eligible State Scenic Highway status of I-40 and the historic interest of Route 66. Views of the background mountains are the most scenic element of views from the highways in the project area, and these could potentially be blocked by the project, if the mirror units are sited sufficiently close to the highway. With recommended **Condition of Certification VIS-3,** those views would be preserved, though the foreground would be strongly altered by the vast array of mirror units, strongly attracting attention to themselves. With this measure, views would not be blocked, but the project's effect on the quality of those views would be strongly adverse and significant. This alteration of visual quality of the surroundings is discussed further under item C, below.

**B. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?**

The project is adjacent to Highway I-40 and Route 66, which are not listed as State Scenic Highways. I-40 has been identified as eligible for such a listing. No notable scenic features or resources are present on-site. The project would not directly damage any specific scenic resources located within the project site. Potential effects on scenic quality within the project viewshed in general are discussed under Item C, below.

**C. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

As described in the main analysis above, the project would substantially degrade the existing visual character and quality of the site and its surroundings. Under the proposed project, an area of 12.8 square miles, including a roughly 5-mile segment of I-40 and Route 66, would experience a dramatic visual transformation from a predominantly natural desert landscape to one of a highly industrial character. The character and quality of views from these transportation facilities would be strongly affected. In the context of a moderately high level of viewer sensitivity of these affected viewpoints, project impacts are considered significant.

**D. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

While highway navigation is not expected to be adversely affected by project glare, nuisance glare is a major issue of concern for the Calico Solar Project, primarily for aesthetic and comfort reasons.

Potentially affected receptors would include motorists on the highways; and hikers, climbers and other visitors in Cady Mountains WSA and associated open trails.

Staff conducted an independent review of potential glare impacts based on limited available project data. With recommended **Condition of Certification VIS- 3**, impacts could be reduced to less-than-significant levels.

## C.13.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage alternative would essentially be a 275 MW solar facility located within the central portion of the proposed 850 MW project. It was developed because it can be constructed. This alternative's boundaries and the revised locations of the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 1**.

### C.13.5.1 SETTING AND EXISTING CONDITIONS

Regionally, the setting and existing conditions for the Reduced Acreage alternative would not differ substantially from the proposed project. However, the setting at the boundary of the alternative would differ substantially from the proposed project. Under the alternative, substantially fewer solar dishes would be deployed and the project would be farther from the boundary of Cady Mountain WSA and nearby ACECs. It would also be farther from the proposed Mojave Trails National Monument. It would not be appreciably different for viewers on I-40, which would remain the southern boundary of the project.

### C.13.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The reduced area alternative is 31% the size of the proposed project. Under this alternative, the project site would be set back approximately a mile from the highway, substantially reducing the visual prominence of the mirror field. Because both the proximity to the highway and extent of the mirror fields would be greatly reduced, overall visual change due to this alternative would be substantially less than under the proposed project. Coincidentally, the overall appearance would be somewhat similar to the AFC simulation of KOP 5, which depicts the project at a similar distance to the Reduced Acreage Alternative, and depicts a similarly reduced overall scale. With this setback and reduced area, overall visual change could be considered moderate.

Due to the large set-back, nuisance glare in the eyes of approaching motorists would be substantially reduced due to the much lower proportion of the field of view occupied by the mirrors. Motorists approaching on I-40 from the east in the morning could still be subject to bright glare from the front row of solar units on the eastern edge of the site for

a considerable distance approaching the site, since the units would be directly ahead of the motorist. However, except for such short-lived events, overall nuisance glare effects would be substantially reduced due to distance. The reduced acreage alternative would not reduce potential glare impacts on train operators, as the railroad would still pass through the site.

### C.13.5.3 CEQA LEVEL OF SIGNIFICANCE AND ADVERSE EFFECTS UNDER NEPA

The reduced acreage alternative would set back the project boundary approximately 1 mile from the highway, and in most instances, nearly 2 miles from the Cady Mountains WSA. This would eliminate the foreground impacts as seen from these two locations. Middle-ground impacts would be reduced, as less of the landscape in the middle-ground would be occupied. Likewise, the increased setback of this alternative would eliminate the possibility of obstructing scenic views of the background mountains. Given the moderate level of existing scenic quality of the viewshed, although the level of overall viewer sensitivity of these viewpoints is considered to be moderately high, the moderate level of overall visual change and the greatly reduced level of nuisance glare of the Reduced Acreage Alternative could be considered acceptable, and less-than-significant. The BLM is in the process of establishing visual resource management classifications for the proposed project and surrounding areas.

## C.13.6 AVOIDANCE OF DONATED AND ACQUIRED LANDS ALTERNATIVE

The Avoidance of Donated and Acquired Lands Alternative would be an approximately 720 MW solar facility located within the boundaries of the proposed 850 MW project. This alternative, the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 2**.

### C.13.6.1 SETTING AND EXISTING CONDITIONS

Avoiding donated and acquired lands alters the eastern boundary of the project area and reduces the number of solar dishes. However, with regard to visual setting and existing conditions, this alternative would be very similar to the proposed project, as discussed in Section C.13.4.1. This is because the areas withdrawn by this alternative are remote from the highway and affect only a portion of the boundary with the WSA. The arrays would occupy most of the same surface as in the proposed project.

### C.13.6.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The impacts of avoidance alternative would not differ in a meaningful way from those described in Section C.13.4.2. for the proposed project. The vast size of the site would be reduced, but not in a way that would be readily perceptible to most viewers, in particular those on the highways.

### C.13.6.3 CEQA LEVEL OF SIGNIFICANCE AND ADVERSE EFFECTS UNDER NEPA

Because there would be no readily perceptible reduction in visual impact, the impacts would remain significant, as described for the proposed project in Section C.13.4.3. The BLM is in the process of establishing visual resource management classifications for the proposed project and surrounding areas.

## C.13.7 NO PROJECT / NO ACTION ALTERNATIVE

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 1781 (b)] in conformance with applicable statutes, regulations, policy and land use plan.

## NO PROJECT/NO ACTION ALTERNATIVE #1

**No Action on the Calico Solar Project Application and on CDCA Land Use Plan Amendment**

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 1781 (b)] in conformance with applicable statutes, regulations, policy and land use plan.

The results of the No Project / No Action Alternative would be the following:

- The impacts of the proposed project would not occur.
- The land on which the project is proposed may or may not become available to other uses (including another solar project), depending on BLM's actions with respect to the amendment of the California Desert Conservation Area Plan.
- The benefits of the proposed project in reducing greenhouse gas emissions from gas-fired generation would not occur. Both State and Federal law support the increased use of renewable power generation.

Under this alternative, the proposed Calico Solar Project would not be approved by the Energy Commission and BLM, and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, no loss or degradation to cultural resources from construction or operation of the proposed project would occur. However, the land on which the project is proposed would become available to other

uses that are consistent with BLM's land use plan, including another solar project requiring a land use plan amendment. In addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

If this project is not approved, renewable projects would likely be developed on other sites in the California Desert or in adjacent states as developers strive to provide renewable power that complies with utility requirements and State/Federal mandates. For example, there are large solar and wind projects proposed on BLM land along the Interstate 40 corridor within a few miles of the Calico Solar Project site. In addition, there are currently over 70 applications for solar projects covering over 650,000 acres pending with BLM in California.

## NO PROJECT/NO ACTION ALTERNATIVE #2

### No Action on Calico Solar Project and Amend the CDCA Land Use Plan to Make the Area Available for Future Solar Development

Under this alternative, the proposed Calico Solar Project would not be approved by the Energy Commission and BLM, and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with a different solar technology. As a result, ground disturbance would result from the construction and operation of the facility providing different solar technology and would likely result in a loss or degradation to cultural resources. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all solar technologies require some grading and ground disturbance. As such, this No Project/No Action Alternative could result in impacts to cultural resources similar to the impacts under the proposed project.

## NO PROJECT/NO ACTION ALTERNATIVE #3

### No Action on the Calico Solar Project Application and Amend the CDCA Land Use Plan to Make the Area Unavailable for Future Solar Development

Under this alternative, the proposed the Calico Solar Project would not be approved by the Energy Commission and BLM, and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no corresponding land disturbance. As a result, the cultural resources of the site are not expected to change noticeably from existing conditions and, as such, this No Project/No

Action Alternative would not result in impacts to cultural resources. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

If this project is not approved, renewable projects would likely be developed on other sites in the California Desert or in adjacent states as developers strive to provide renewable power that complies with utility requirements and State/Federal mandates. For example, there are large solar and wind projects proposed on BLM land along the Interstate 40 corridor within a few miles of the Calico Solar Project site. In addition, there are currently over 70 applications for solar projects covering over 650,000 acres pending with BLM in California. If the No Project/No Action Alternative #2 is approved, impacts to visual resources on the project site could still occur as a result of approval of another renewable energy project proposal.

## C.13.8 PROJECT-RELATED FUTURE ACTIONS - VISUAL RESOURCES

This section examines the potential impacts of future transmission line construction, line removal, substation expansion, and other upgrades that may be required by Southern California Edison Company (SCE) as a result of the Calico Solar Project. The SCE upgrades are a reasonably foreseeable event if the Calico Solar Project is approved and constructed as proposed.

The SCE project will be fully evaluated in a future EIR/EIS prepared by the BLM and the California Public Utilities Commission. Because no application has yet been submitted and the SCE project is still in the planning stages, the level of impact analysis presented is based on available information. The purpose of this analysis is to inform the Energy Commission and BLM, interested parties, and the general public of the potential environmental and public health effects that may result from other actions related to the Calico Solar Project.

The project components and construction activities associated with these future actions are described in detail in Section B.3 of this Staff Assessment/EIS. This analysis examines the construction and operational impacts of two upgrade scenarios:

- The **275 MW Early Interconnection Option** would include upgrades to the existing SCE system that would result in 275 MW of additional latent system capacity. Under the 275 MW Early Interconnection option, Pisgah Substation would be expanded adjacent to the existing substation, one to two new 220 kV structures would be constructed to support the gen-tie from the Calico Solar Project into Pisgah Substation, and new telecommunication facilities would be installed within existing SCE ROWs.
- The **850 MW Full Build-Out Option** would include replacement of a 67-mile 220 kV SCE transmission line with a new 500 kV line, expansion of the Pisgah Substation at a new location and other telecommunication upgrades to allow for additional transmission system capacity to support the operation of the full Calico Solar Project.

## C.13.8.1 ENVIRONMENTAL SETTING

The environmental setting described herein incorporates both the 275 MW Early Interconnection and the 850 MW Full Build-Out options. The setting for the 275 MW Early Interconnection upgrades at the Pisgah Substation and along the telecomm corridors is included within the larger setting for the project area under the 850 MW Full Build-Out option, which also includes the Lugo-Pisgah transmission corridor.

The transmission line construction project as proposed would be an upgrade of an existing transmission line. For approximately 57 miles the transmission line would replace an existing 220 kV line, within the existing ROW area for that line. For the remaining approximately 10 miles of the route, the proposed line would be constructed within a new ROW area in the vicinity of Hesperia.

The visual environment associated with the project area is generally natural and not highly altered from predevelopment conditions; however, there are existing and proposed transmission line and other linear features in the area, including the proposed ROW area. Visual resources in the area of the upgrades have been affected along portions of the routes by past and present actions, including highway/roadway construction, and residential and commercial development. The transmission route would pass through BLM lands and run adjacent to wilderness areas and ACECs, including the Ord-Rodman DWMA. The project area includes broad expanses of Basin and Range topography of the Mohave Desert region, and the ROWs generally traverse between alluvial valley debris flows and rugged mountain ranges. Views are generally expansive through this portion of the project area.

No specific Visual Resource Management (VRM) designations have yet been identified for BLM lands crossed by the SCE upgrades; however, based upon the minimal alterations to the existing environment, it is assumed that most of the lands, especially at the northeastern end would have a Class II or III designation with wilderness areas, ACECs and DWMAs classified as Class I. No qualitative evaluations of the project area scenic quality were completed for this study.

## C.13.8.2 ENVIRONMENTAL IMPACTS

For the proposed 500 kV route, new dulled galvanized 500 kV LST structures would be installed in the existing and new ROW. Single-circuit LSTs generally range in height between 91 feet and 194 feet. Most of the structure sites would likely require minor to substantial grading and new or re-developed access and spur roads.

The project would require temporary staging areas for equipment and materials storage along the transmission line route. Generally these yards range in size from a few acres to up to approximately 30 acres. Construction of the expanded Pisgah Substation would likely require a temporary laydown area located at or near the existing roadway at the site.

Conductor pulling and tensioning equipment would be located at various sites along the transmission line ROW. Depending on the terrain and the number of angles and dead-end sites, numerous pull sites would likely be needed.

The project would be visible from foreground, middle ground, and distant views from sensitive viewpoints (e.g., highways, residences, trail heads, wilderness areas, and scenic overlooks) located along the proposed ROW. The project would be visible from travelers along I-40 and Highway 66; however, two existing 220 kV transmission lines are currently located within the proposed ROW in these areas. I-40 is currently classified as an eligible state scenic highway, not officially designated (Caltrans 2010). Construction equipment and activities would also be visible to motorists other local roadways and to residents living near the construction activities in Hesperia. Although a BLM visual resource contrast rating analysis has not been completed, due to temporary duration of the project construction, the adverse visual impacts that would occur during construction would not likely be significant. This conclusion assumes that construction areas and the ROW would be restored to their pre-project conditions, as discussed below.

During project operation, the upgrades would include the construction of new permanent spur and access roads to the individual structure sites and Pisgah Substation, which could create permanent visual scars across the undeveloped landscape.

Construction of the 500 kV line would be largely within an existing ROW across undeveloped BLM lands, and would parallel a major existing utility corridor with up to three other existing transmission lines for its length. Because the existing transmission lines and towers are an established part of the setting and the project would include removal of the existing 220 kV line and poles, the adverse visual impacts that would occur due to installation of the new line, and any incremental changes in tower height or design, would likely not be significant. This conclusion assumes that the new wires and towers would incorporate typical measures to mitigate potentially significant adverse visual impacts, such as those listed below.

In locations with no previously existing transmission line corridors, the degree of change may be more evident, particularly if poles or towers are placed in visually sensitive locations, such as near residences, against a skyline, or adjacent to highly traveled roadways. Visual resource contrast rating analysis would be required to be completed for BLM-managed lands and sensitive viewshed locations, such as wilderness areas, crossed by or lying adjacent to the project, to determine the degree of change to visual resources in those areas, particularly in areas where no transmission lines currently exist. Expansion to the Pisgah Substation under both options would be noticeable from travelers along I-40, but for only short periods (e.g., less than 1 minute) and the visual change would be reduced under the 275 MW Early Interconnection which would be within a 270 feet by 100 feet area directly adjacent to the existing substation. Upgrades to the Lugo Substation would occur within the existing footprint and are also not expected to result in significant changes to current conditions.

### C.13.8.3 MITIGATION

With the inclusion of mitigation measures similar to those listed below, visual impacts from construction activities related to the upgrades for both options would likely not be significant:

- During project construction, the work site should be kept clean of debris and construction waste. Material and construction storage areas should be selected to minimize views from public roads, trails, and nearby residences.
- For areas where excavated materials would be visible from sensitive viewing locations, excavated materials should be disposed of in a manner that is not visually evident and does not create visual contrasts.
- Maintenance operations work should be conducted in a manner that limits unnecessary scarring or defacing of the natural surroundings to preserve the natural landscape to the extent possible.
- The project owner should revegetate disturbed soil areas to the greatest practical extent. In particular, the area of disturbed soils used for laydown, project construction, and siting of the substation and other ancillary operations and support structures should be revegetated.

The following mitigation measures are associated with the siting and design of the new transmission structures under the 850 MW Full Build-Out option that would help to reduce impacts to visual resources:

- Complete visual resource impact analysis on BLM lands and for other sensitive viewshed locations.
- Attempt to place transmission lines within existing corridors and match tower locations with existing transmission structures.
- Do not place structures against a skyline view or within drainages wherever possible.
- Avoid perpendicular or “straight-line” placement along hillsides wherever possible.
- Non-specular and non-reflective conductors should be used in order to reduce conductor visibility and visual contrast.
- Insulators should be non-reflective and non-refractive.
- Any surface coatings on structures should be applied to new or replacement structures that are visible from sensitive viewing locations with appropriate colors, finishes, and textures to most effectively blend the structures with the visible backdrop landscape. For structures that are visible from more than one sensitive viewing location, if backdrops are substantially different when viewed from different vantage points, the darker color shall be selected, because dark colors tend to blend into landscape backdrops more effectively than lighter colors, which may contrast and produce glare.

## C.13.8.4 CONCLUSION

Construction of the SCE upgrades project would require temporary disturbance during construction (i.e., heavy equipment, tensioning, and pull sites). After rehabilitation of temporary construction yards and pulling sites, as required by the suggested mitigation, the portion of the transmission line within the existing corridor would appear largely as it does now, except for the construction of new and permanent spur and access roads, which would permanently scar the fragile desert landscape.

The SCE upgrades would have the potential to cause adverse long-term visual impacts, such as through the use of reflective conductors and/or insulators that would make existing or new structures more dominant in the existing viewshed, and through the construction of new and larger structures. However, project design features and feasible mitigation measures would be available that would ensure that visual impacts of the project would be reduced. With use of non-specular conductors and non-reflective and non-refractive insulators, potential long-term impacts associated with this activity would be reduced as well.

Because the upgrades would be in a largely undeveloped area on BLM land, would parallel an existing utility corridor or be on/within existing facilities, and would include removal of the existing line, it is expected that visual impacts would be reduced to less than significant along most of the line, but a BLM visual resource contrast rating analysis is required to confirm the analysis. In addition, a portion of the 500 kV transmission line route under the 850 MW Full Build-Out would be within a new 500 kV ROW. Even if the upgrades work complies with all applicable laws, ordinances, regulations and standards (LORS), absent a viewshed analysis from sensitive viewpoints, this Staff Assessment/EIS conservatively concludes that the SCE upgrades may create significant and unmitigable impacts to visual resources due to the construction of 10 miles of new ROW from the Mojave River to the Lugo Substation.

## C.13.9 CUMULATIVE IMPACTS

## C.13.9.1 GEOGRAPHIC EXTENT

Cumulative impacts could occur if implementation of the Calico Solar Project would combine with those of other local or regional projects. The Calico Solar Project is potentially associated with two types of cumulative impact:

1. cumulative impacts within the immediate project viewshed, essentially comprising foreseeable future projects in the Mojave Desert area of San Bernardino County;
2. cumulative impacts of foreseeable future solar and other renewable energy projects within the southern California Desert, or other broad basin of the project's affected landscape type. The widest applicable basin of cumulative effect would include all of the southern California Desert landscapes extending into neighboring states.

**Local Projects (Project Viewshed)**

### Calico Solar Project and Past Projects

Past and present projects occurring in the viewshed of the proposed project site and affecting its existing visual quality include recreational activities managed by the BLM, SCE transmission lines, the Pisgah substation, utility lines, and the I-40 and Route 66 highways.

### Calico Solar Project and Foreseeable Future Projects

Past and foreseeable future projects in the vicinity of the Calico Solar Project are depicted in **Cumulative Impacts Figure 3**, and listed in Cumulative Impacts Table **2 .**

As discussed in Section C.13.4.1 above analyzing the setting of the proposed project, the Calico Solar Project is situated within a fairly limited local viewshed, enclosed by nearby mountains. The area within which it could interact with other future projects is thus somewhat limited. Potential projects listed in Figure 3 and Table 3 include the Pisgah-Lugo transmission upgrade described elsewhere in this report, the Pisgah Substation Expansion, SES Solar 3, Oak Creek Wind Energy, and possibly the Power Partners wind project. These are the projects that appear to have the potential to directly interact with the Calico Solar Project visually.

At this level of direct visual interaction, it is difficult to evaluate the cumulative effects of these projects without some further foreseeable project detail, but because staff already finds that the effects of the Calico Solar Project alone would have substantial visual impacts, potential cumulative impacts would also be substantial taken as a whole.

Within the slightly broader Newberry Springs-Ludlow area of potential cumulative effect, the project in combination with foreseeable projects could have the effect of substantially degrading the overall visual quality of a slightly broader segment of Highway I-40. The segment of I-40 west of the Calico Solar Project site however is already considered by staff to be visually compromised by development. The listed projects however have the potential to further degrade a currently intact segment of I-40, which is listed as an eligible State Scenic Highway, from the Calico Solar Project site eastward. This effect could be cumulatively substantial, depending upon the details of the specific projects.

## Regional Solar/Renewable Development Projects

### Calico Solar Project and Past Regional Projects

The Calico Solar Project is among the first of a large number of existing solar project applications in the CDD. As such, past and present projects have had a negligible region-wide cumulative impact.

### Calico Solar Project and Foreseeable Future Projects

The analysis of cumulative impacts is not necessarily restricted to the immediate viewshed of a project, and the need for cumulative analysis over a broad geographic area may often be determined by the affected resource itself. In this case the affected resource is the unique and highly valued landscape type of which the project site forms a small part – the landscape of the Mojave Desert.

The Mojave Desert and California Desert Conservation Area (CDCA) within which the Calico Solar Project is located are a unique and highly valued scenic resource of national importance, as reflected by the presence of three national parks and numerous Wilderness Areas within its boundaries. Cumulative Impacts Table 1 identifies 72 solar projects and 61 wind project applications with a total overall area of over one million acres within the CDCA, which is indicative of the interest in public lands for renewable energy generation at a regional level.

This figure does not include renewable projects within the Nevada and Arizona portions of the Mojave Desert. Of the 61 wind applications in the California Desert District, only

five of the applications are for wind development; the remaining proposals are for site testing and monitoring. BLM's experience is that a small percentage of applications for site testing have resulted in wind development proposals. In regards to the solar applications filed with BLM in California, only approximately 10% of the proponents have prepared acceptable detailed Plans of Development required by BLM to begin a NEPA analysis.

Although it is unlikely that all of the future solar and wind development projects proposed in the region would be constructed, it is reasonable to assume that some of them will be constructed, in light of the state and federal mandates for renewable energy development. With this very high number of renewable energy applications currently filed with BLM, the potential for profound widespread cumulative impacts to scenic resources within the southern California is clear.

These cumulative impacts could include a substantial decline in the overall number and extent of scenically intact, undisturbed desert landscapes, and a substantially more urbanized character in the overall southern California desert landscape. In particular, the number of current renewable applications before the BLM and Energy Commission that could potentially be prominently visible from the desert region's major highways is proportionally high, and the proportion of those highways that could be affected is also high. Because these highways are the location from which the vast majority of viewers experience the California desert, this potential effect is of concern to staff. Viewed in the cumulative context of the Southern California desert as a whole, potential visual impacts of renewable energy projects are considered to be cumulatively considerable and potentially significant.

### C.13.9.2 CUMULATIVE IMPACT CONCLUSION

The anticipated visual impacts of the Calico Solar Project in combination with past and foreseeable future local projects in the Mohave Desert region, and past and foreseeable future region-wide projects in the southern California desert are considered cumulatively considerable, and potentially significant.

## C.13.10 COMPLIANCE WITH LORS

**Visual Resources Table 3**
**Project Compliance with Laws, Ordinances, Regulations, and Standards (LORS)**

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| **Federal** | | |
| National Environmental Policy Act (NEPA) | As discussed above, applicable federal requirements for visual impact assessment are enacted through application of the BLM VRM methodology, discussed below. | |
| Federal Land Policy and Management Act of 1976 (FLPMA) | Section 102 (a) of the Federal Land Policy and Management Act of 1976 (FLPMA) states that " . . . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values …. "<br><br>Section 103 (c) identifies "scenic values" as one of the resources for which public land should be managed.<br><br>Section 201 (a) states that "The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including ... scenic values) ...."<br><br>Section 505 (a) requires that "Each right-of-way shall contain terms and conditions which will... minimize damage to the scenic and esthetic values...." | Refer to CDCA discussion, below. |

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| California Desert Conservation Area Plan (CDCA Plan) | The CDCA Plan represents the Resource Management Plan (RMP) for the area required under FLPMA. The CDCA Plan did not contain VRM mapping as in most RMPs.<br><br>The Calico site is classified in the CDCA Plan as Multiple-Use Class (MUC) M (Moderate Use). MUC M lands are managed to provide a wider variety of uses such as mining, grazing, recreation, utilities, and energy development, while conserving desert resources and mitigating damages permitted uses may cause.<br><br>Under the CDCA Plan Electrical Power Generation Facilities, including Wind/Solar facilities, may be allowed within MUC Class M if NEPA requirements are met. | Consistent. Solar electrical generation plants are specifically allowed for under the MUC Class M Guidelines if NEPA requirements are met.<br><br>Disclosure of potential visual project effects under NEPA has been conducted through the analysis in this study. |
| National Historic Preservation Act (NHPA) | Under regulations of the NHPA, visual impacts to a listed or eligible National Register property that may diminish the integrity of the property's ". . . setting . . .(or) feeling . . . ." in a way that affects the property's eligibility for listing, may result in a potentially significant adverse effect. "Examples of adverse effects . . . include . . .: Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features . . . . " (36 CFR Part 800.5) | These potential impacts are addressed in the **Cultural Resources** section of this SA/DEIS. |

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| **State** | | |
| State Scenic Highway Program (CA. Streets and Highways Code, Section 260 et seq.) | The State Scenic Highway Program promotes protection of designated State scenic highways through certification and adoption of local scenic corridor protection programs that conform to requirements of the State program. | Consistent. Interstate 40 within the project viewshed is eligible to be State scenic highway, but has not been designated as such. |
| **Local** | | |
| San Bernardino County General Plan (2007)<br><br>Applicable Conservation Element Goals, Objectives, Programs | ***CONSERVATION ELEMENT***<br><br>*GOAL CO 1*. The County will maintain to the greatest extent possible natural resources that contribute to the quality of life within the County.<br><br>Policy CO 1.2 The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas. | None of the project site is under county jurisdiction; however State and Federal agencies endeavor to conform to local goals, policies, objectives, and ordinances where practicable.<br><br>County policy is to minimize development density within a mile buffer around designated federal resources in order to preserve visual and natural qualities. The project would not conform to this goal. |

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| San Bernardino County General Plan (2007)<br><br>Applicable Conservation Element Goals, Objectives, Programs (continued) | Policy CO 8.1 Maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy facilities. The County will site energy facilities equitably in order to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce peak load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly.<br><br>4. The County will consult with electric utilities during the construction of their major transmission line towers to ensure that they are aesthetically compatible with the surrounding environment.<br><br>8. The County shall consult with electric utilities during the planning construction of their major transmission lines towers to ensure that they are aesthetically compatible with the surrounding environment.<br><br>***OPEN SPACE ELEMENT***<br><br>*GOAL OS 4.* The County will preserve and protect cultural resources throughout the County, including parks, areas of regional significance, and scenic, cultural and historic sites that contribute to a distinctive visual experience | While adverse effects will be minimized to the degree feasible, they still will be adverse and significant.<br><br>There are no communities within the project vicinity.<br><br>The project would not be consistent with the goal to preserve and protect scenic sites “that contribute to a distinctive visual experience.” |

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| San Bernardino County General Plan (2007)<br><br>Applicable Conservation Element Goals, Objectives, Programs (continued) | *GOAL OS 5*. The County will maintain and enhance the visual character of scenic routes in the County.<br><br>Scenic Route: Interstate 40 from Ludlow northeast to Needles. (p. 223)<br><br>***LAND USE ELEMENT***<br><br>GOAL D/LU 1. Maintain land use patterns in the Desert Region that enhance the rural environment and preserve the quality of life of the residents of the region.<br><br>***CONSERVATION ELEMENT***<br><br>GOAL D/CO 3. Preserve the dark night sky as a natural resource in the Desert Region communities.<br><br>POLICIES<br>D/CO 3.1 Protect the Night Sky by providing information about and enforcing existing ordinances:<br>a. Provide information about the Night Sky ordinance and lighting restrictions with each land use or building permit application.<br>b. Review exterior lighting as part of the design review process.<br>D/CO 3.2 All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.<br>D/CO 3.3 Allow for desert communities' input on the need for, and placement of, new street lights. | Interstate 40 from Ludlow northeast to Needles is designated by the County as a scenic route. The project site is west of and not visible from this designated section of I-40, therefore the project is consistent with this Goal.<br><br>Consistent. With recommended Condition of Certification VIS-2, upward illumination would be shielded, and outdoor illumination in general would be minimized.<br><br>Consistent. Under recommended Condition of Certification VIS-2, the required project lighting plan would be provided to the County for review prior to project construction. Potential for nighttime light pollution would be minimized through shielding, downward-directed lighting, and minimum lighting consistent with safety. Lit areas not occupied on a continuous basis would operate only when the area is occupied. With this condition, the project would conform with these policies. |

| LORS | | Consistency with Staff-Recommended Conditions of Certification (Project) |
|---|---|---|
| San Bernardino Development Code Chapter 83.07.040 Glare and Outdoor Lighting - Mountain and Desert Regions. | Sets various standards and conditions for external lighting in residential and commercial situations. Exempts facilities on Federal Property | With staff-recommended Condition of Certification VIS-2, the project would meet the standards set in this Chapter of the Code. |

## C.13.11 NOTEWORTHY PUBLIC BENEFITS

No noteworthy public benefits in the area of visual resources were identified.

## C.13.12 FACILITY CLOSURE

Staff has addressed facility closure and decommissioning impacts to Visual Resource under individual headings in Assessment of Impacts and Discussion of Mitigation above.

## C.13.13 CONCLUSIONS

The proposed project and Avoidance of Donated and Acquired Lands Alternative would both substantially degrade the existing visual character and quality of the site and its surroundings. Under the proposed project, an area of 12.8 square miles, including approximately 5 miles of frontage on I-40, would experience a dramatic visual transformation from a predominantly natural desert landscape to one of a highly industrial character, strongly affecting motorists on the highway. Given the moderately high level of viewer sensitivity of these affected viewpoints, project impacts under these two alternatives are considered significant under CEQA. With staff-recommended mitigation measures, these impacts could be greatly reduced, but would remain significant and unavoidable under CEQA.

Under the proposed project and the Avoidance of Donated and Acquired Lands Alternative, the character and quality of some views from foreground and near-middle-ground areas of the Cady Mountains WSA would be adversely affected under NEPA, but the overall effect on views from the Cady Mountains WSA is considered to be less-than-significant under CEQA. The Avoidance of Donated and Acquired Lands Alternative would remain significant to viewers from I-40, and unavoidable. The degree and extent of those impacts would be similar to those of the proposed project under NEPA.

Impacts of the Reduced Acreage Alternative would be substantially less than the proposed project and are considered less-than-significant under CEQA.

The anticipated visual impacts of the Calico Solar Project and alternatives, in combination with past and foreseeable future local projects in the Mojave Desert region,

and past and foreseeable future region-wide projects in the southern California desert are considered cumulatively considerable and potentially significant under CEQA.

In the absence of photometric data to the contrary, staff believes that diffuse reflection from the SunCatchers could be an intrusive and distracting nuisance to motorists under at least certain conditions, particularly when an entire row of units could be visible in a near-vertical position to approaching motorists at hours near sunrise and sunset. However, with staff-recommended **Condition of Certification VIS-3,** potential glare/reflection impacts could be reduced to less-than-significant levels under CEQA.

With staff-recommended **Condition of Certification VIS-4**, construction impacts could be mitigated to less- than-significant levels under CEQA.

## C.13.14 MITIGATION MEASURES/PROPOSED CONDITIONS OF CERTIFICATION/APPROVAL

## SURFACE TREATMENT OF NON-MIRROR PROJECT STRUCTURES AND BUILDINGS

**VIS-1** The project owner shall treat all non-mirror surfaces of all project structures and buildings visible to the public such that a) their colors minimize visual intrusion and contrast by blending with the existing tan and brown color of the surrounding landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. This measure shall include coloring of security fencing with vinyl or other non-reflective coating; or with slats or similar semi-opaque, non-reflective material, to blend to the greatest feasible extent with the background soil.

The project owner shall submit for CPM review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. A specific schedule for completion of the treatment; and

E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final

treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by BLM's Authorized Officer and the CPM. Subsequent modifications to the treatment plan are prohibited without BLM's Authorized Officer and CPM approval.

**Verification:** At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to BLM's Authorized Officer and the CPM for review and approval and simultaneously to San Bernardino County for review and comment. If BLM's Authorized Officer and the CPM determine that the plan requires revision, the project owner shall provide to BLM's Authorized Officer and the CPM a plan with the specified revision(s) for review and approval by BLM's Authorized Officer and the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to BLM's Authorized Officer and the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify BLM's Authorized Officer and the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit to each one set of electronic color photographs from the same key observation points identified in (d) above. The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

## TEMPORARY AND PERMANENT EXTERIOR LIGHTING

**VIS-2** To the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting and all temporary construction lighting such that a) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky, except for required FAA aircraft safety lighting; d) illumination of the project and its immediate vicinity is minimized, and e) the plan complies with local policies and ordinances. The project owner shall submit to BLM's Authorized Officer and the CPM for review and approval and simultaneously to the County of San Bernardino for review and comment a lighting mitigation plan that includes the following:

A. Location and direction of light fixtures shall take the lighting mitigation requirements into account;

B. Lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements;

C. Lighting shall incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated;

D. Light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security;

E. All lighting shall be of minimum necessary brightness consistent with operational safety and security; and

F. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied.

**Verification:** At least 90 days prior to ordering any permanent exterior lighting or temporary construction lighting, the project owner shall contact BLM's Authorized Officer and the CPM to discuss the documentation required in the lighting mitigation plan. At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to BLM's Authorized Officer and the CPM for review and approval and simultaneously to the County of San Bernardino for review and comment a lighting mitigation plan. If BLM's Authorized Officer and the CPM determine that the plan requires revision, the project owner shall provide to BLM's Authorized Officer and the CPM a revised plan for review and approval by BLM's Authorized Officer and the CPM.

The project owner shall not order any exterior lighting until receiving BLM Authorized Officer and CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify BLM's Authorized Officer and the CPM that the lighting has been completed and is ready for inspection. If after inspection, BLM's Authorized Officer and the CPM notify the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify BLM's Authorized Officer and the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide BLM's Authorized Officer and the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify BLM's Authorized Officer and the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to BLM's Authorized Officer and the CPM within 30 days.

## SETBACK OF SUNCATCHERS FROM HIGHWAY I-40

**VIS-3** To reduce the visual dominance and glare effects of the SunCatchers to motorists on Highway I-40, the applicant shall set back the nearest units to the area north of the existing pipeline right-of-way, and at a minimum distance of 500 feet from the edge of the roadway, whichever is greater.

**Verification:** At least 90 days prior to start of construction, the project owner shall present to BLM's Authorized Officer and the CPM a revised plan depicting how the proposed SunCatchers will be set back from the highway. If BLM's Authorized Officer

and the CPM determine that the plan requires revision, the project owner shall provide to BLM's Authorized Officer and the CPM a revised plan for review and approval by BLM's Authorized Officer and the CPM.

The project owner shall not begin construction until receiving BLM Authorized Officer and CPM approval of the revised plan.

## SCREENING, SET-BACK AND RE-VEGETATION OF STAGING AREA

**VIS-4** In order to minimize the visual prominence of the proposed staging area adjoining I-40 to motorists, the project owner shall provide opaque screening of the site as seen from the highway, and a set-back from the roadway of at least 250 feet. In addition, the project owner shall provide a re-vegetation plan describing how the staging site will be restored following construction. The plan shall call for beginning of restoration of the site within the shortest feasible time following completion of construction.

**Verification:** At least 90 days prior to start of construction, the project owner shall present to BLM's Authorized Officer and the CPM a revised staging area site plan including a set-back from I-8 of at least ¼-mile. If BLM's Authorized Officer and the CPM determine that the plan requires revision, the project owner shall provide to BLM's Authorized Officer and the CPM a revised plan for review and approval by BLM's Authorized Officer and the CPM. The project owner shall not begin construction until receiving BLM Authorized Officer and CPM approval of the revised plan.

At least 60 days prior to start of operation, the project owner shall present to BLM's Authorized Officer and the CPM a revegetation plan for the staging area. If BLM's Authorized Officer and the CPM determine that the plan requires revision, the project owner shall provide to BLM's Authorized Officer and the CPM a revised plan for review and approval by BLM's Authorized Officer and the CPM. The project owner shall not begin operation until receiving BLM Authorized Officer and CPM approval of the revised plan.

## C.13.15 REFERENCES


NPS 2009, 2010 California Desert Protect Act Overview (map), December 21, 2009. http://feinstein.senate.gov/public/index.cfm?FuseAction=NewsRoom.PressReleases&ContentRecord_id=B3A780D4-5056-8059-7606-3936A2F7945F , [Map link in Related Resources menu.] Accessed 1/6/2010.

NPS 2008, Cady Mountains Proposed Wilderness and Existing Wilderness Study Area (map), June 24, 2008. http://www.nplnews.com/archives2008.asp [link in 'Hot Topics'.] Accessed 1/6/2010

SES 2008a – Stirling Energy Systems/R. Liden (tn: 49181). Application for Certification, dated December 1, 2008. Submitted to CEC/Docket Unit on December 1, 2008.

SES 2009p - Stirling Energy Systems/C. Champion (tn: 52956). Applicants' Response to Energy Commission & Bureau of Land Management's Data Requests 113-127 of Data Requests Set 1, Part 2, dated August 20, 2009. Submitted to CEC/Docket Unit on August 24, 2009.

USDOI, 1995. State of California Wilderness Status Map.

Caltrans (California Department of Transportation), 2006. Scenic Highway Master Plan.

County of San Bernardino, 2007. General Plan.

# ENERGY COMMISSION VISUAL RESOURCE ANALYSIS EVALUATION CRITERIA

Energy Commission staff conducts a visual resource analysis according to Appendix G, "Environmental Checklist Form—Aesthetics," California Environmental Quality Act (CEQA). The CEQA analysis requires that commission staff make a determination of impact ranging from "Adverse and Significant" to "Not Significant."

Staff's analysis is based on Key Observation Points or KOPs. KOPs are photographs of locations within the project area that are highly visible to the public — for example, travel routes; recreational and residential areas; and bodies of water as well as other scenic and historic resources.

Those photographs are taken to indicate existing conditions without the project and then modified to include a simulation of the project. Consequently, staff has a visual representation of the viewshed before and after a project is introduced and makes its analysis accordingly. Information about that analytical process follows.

## Visual Resource Analysis Without Project

When analyzing KOPs of existing conditions without the project, staff considers the following conditions: visual quality, viewer concern, visibility, number of viewers, duration of view. Those conditions are then factored into an overall rating of viewer exposure and viewer sensitivity. Information about each condition and rating follows.

### Visual Quality

An expression of the visual impression or appeal of a given landscape and the associated public value attributed to the resource. Visual quality is rated from *high* to *low*. A high rating is generally reserved for landscapes viewers might describe as picture-perfect.

Landscapes rated high generally are memorable because of the way the components combine in a visual pattern. In addition, those landscapes are free from encroaching elements, thus retaining their visual integrity. Finally, landscapes with high visual quality are visually coherent and harmonious when each element is considered as part of the whole. On the contrary, landscapes rated *low* are often dominated by visually discordant human alterations.

### Viewer Concern

Viewer concern represents the reaction of a viewer to visible changes in the viewshed — an area of land visible from a fixed vantage point. For example, viewers have a high expectation for views formally designated as a scenic area or travel corridor as well as for recreational and residential areas. Viewers generally expect that those views will be preserved. Travelers on highways and roads, including those in agricultural areas, are generally considered to have moderate viewer concerns and expectations.

However, viewers tend to have low-to-moderate viewer concern when viewing commercial buildings. And industrial uses typically have the lowest viewer concern. Regardless, the level of concern could be lower if the existing landscape contains discordant elements. In addition, some areas of lower visual quality and degraded visual character may contain particular views of substantially higher visual quality or interest to the public.

### Visibility

Visibility is a measure of how well an object can be seen. Visibility depends on the angle or direction of views; extent of visual screening; and topographical relationships between the object and existing homes, streets, or parks. In that sense, visibility is determined by considering any and all obstructions that may be in the sightline—trees and other vegetation; buildings; transmission poles or towers; general air quality conditions such as haze; and general weather conditions such as fog.

### Number of Viewers

*Number of viewers* is a measure of the number of viewers per day who would have a view of the proposed project. *Number of viewers* is organized into the following categories: residential according to the number of residences; motorist according to the number of vehicles; and recreationists.

### Duration of View

Duration of view is the amount of time to view the site. For example, a high or extended view of a project site is one reached across a distance in 2 minutes or longer. In contrast, a low or brief duration of view is reached in a short amount of time—generally less than 10 seconds.

### Viewer Exposure

Viewer exposure is a function of three elements previously listed, *visibility*, *number of viewers*, and *duration of view*. Viewer exposure can range from a *low* to *high*. A partially obscured and brief background view for a few motorists represents a low value; and unobstructed foreground view from a large number of residences represents a high value.

### Visual Sensitivity

Visual sensitivity is comprised of three elements previous listed, *visual quality*, *viewer concern*, and *viewer exposure*. Viewer sensitivity tends to be higher for homeowners or people driving for pleasure or engaged in recreational activities and lower for people driving to and from work or as part of their work.

## Visual Resource Analysis with Project

Visual resource analyses with photographic simulations of the project involve the elements of contrast, dominance, view blockage, and visual change. Information about each element follows.

### Contrast

Contrast concerns the degree to which a project's visual characteristics or elements — form, line, color, and texture — differ from the same visual elements in the existing landscape. The degree of contrast can range from *low* to *high*. A landscape with forms, lines, colors, and textures similar to those of a proposed energy facility is more visually absorbent; that is, more capable of accepting those characteristics than a landscape in which those elements are absent.[1] Generally, visual absorption is inversely proportional to visual contrast.

### Dominance

*Dominance* is a measure of (a) the proportion of the total field of view occupied by the field; (b) a feature's apparent size relative to other visible landscape features; and (c) the conspicuousness of the feature due to its location in the view.

A feature's level of dominance is lower in a panoramic setting than in an enclosed setting with a focus on the feature itself. A feature's level of dominance is higher if it is (1) near the center of the view; (2) elevated relative to the viewer; or (3) has the sky as a backdrop. As the distance between a viewer and a feature increases, its apparent size decreases; and consequently, its dominance decreases. The level of dominance ranges from *low* to *high*.

### View Blockage

The extent to which any previously visible landscape features are blocked from view constitutes view disruption. The view is also disrupted when the continuity of the view is interrupted. When considering a project's features, higher quality landscape features can be disrupted by lower quality project features, thus resulting in adverse visual impacts. The degree of view disruption can range from *none* to *high*.

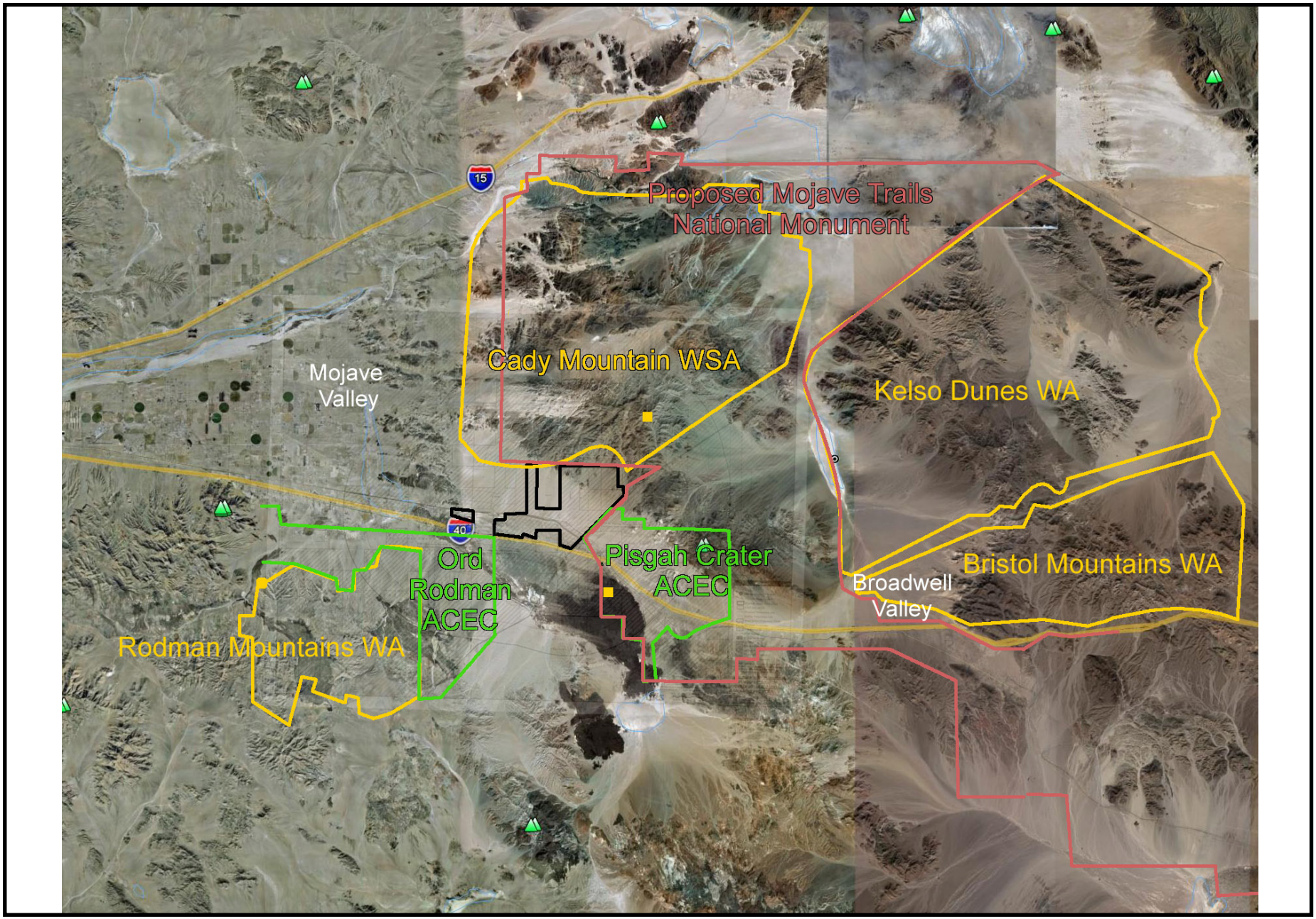
### Visual Change

Visual change is a function of *contrast*, *dominance*, and *view disruption*. Generally, *contrast* and *dominance* contribute more to the degree of visual change than does *view disruption*.

[1] Typically, the Energy Commission does not consider texture in its visual analyses.

**VISUAL RESOURCES - FIGURE 1**

Calico Solar Project - Project Setting




**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: BLM, Google, WKA

**VISUAL RESOURCES - FIGURE 2A**
Calico Solar Project - Character Photos of Project Area

Character Photo Location 1
View of existing transmission lines along eastern boundary of Project site (looking northeast)

Character Photo Location 2
View of existing transmission lines and SCE Pisgah Substation along eastern boundary of Project site (looking south)

**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**
SOURCE: AFC Figure 5.13-3

**VISUAL RESOURCES - FIGURE 2B**
Calico Solar Project - Character Photos of Project Area

Character Photo Location 3
View of closest residence to the Project site (approximately 2.0 miles east of site)

Character Photo Location 4
View of BNSF railroad (and train) which bisects the Project site (looking south from midsection of Phase I)

**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**
SOURCE: AFC Figure 5.13-4

**VISUAL RESOURCES - FIGURE 2C**
Calico Solar Project - Character Photos of Project Area

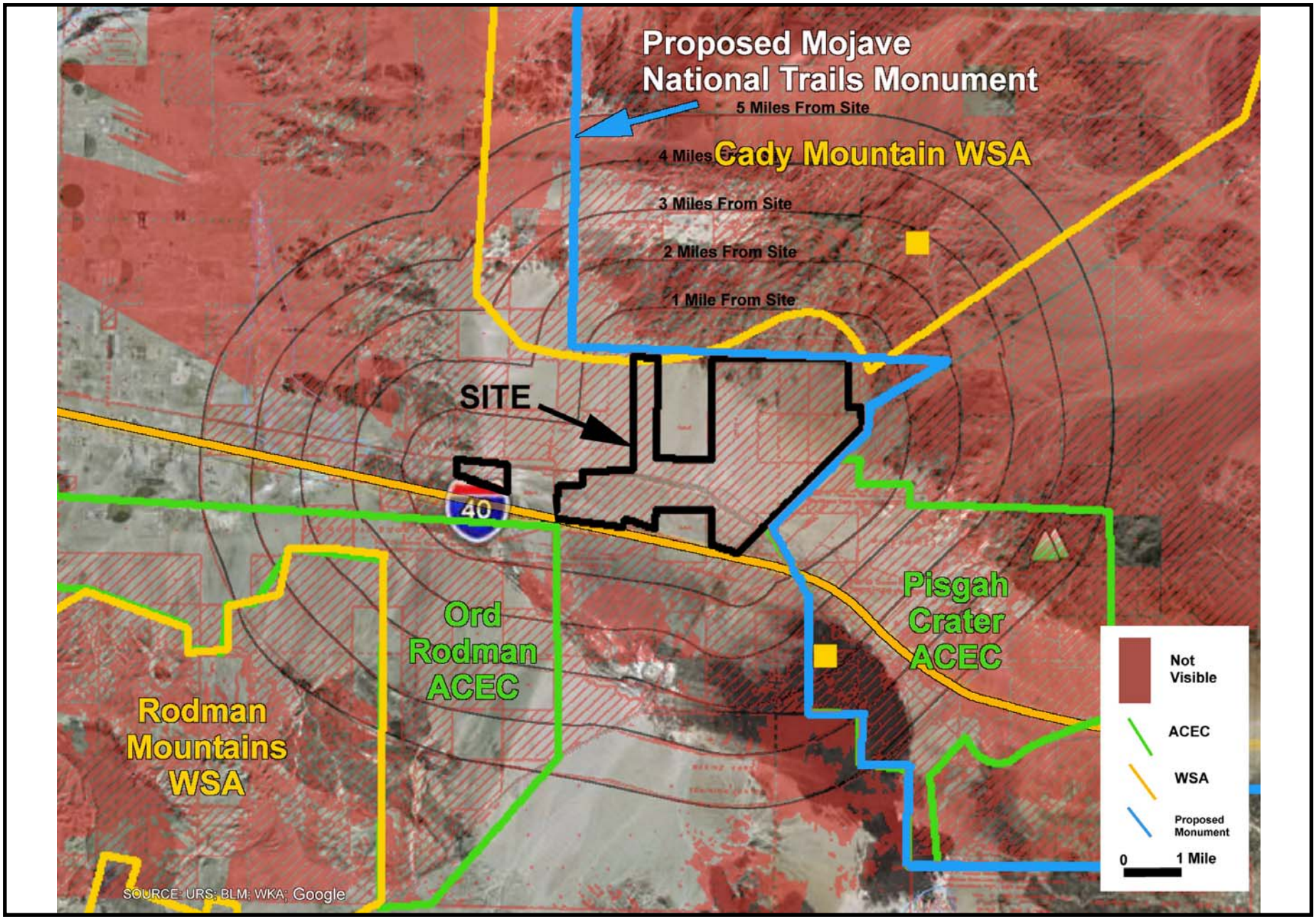
Character Photo Location 5
View of Project site from BNSF Railroad

Character Photo Location 6
View of Project site from Hector Road (approximately 1.5 miles west of site)

**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**
SOURCE: AFC Figure 5.13-5

**VISUAL RESOURCES - FIGURE 3**

Calico Solar Project - Project Viewshed



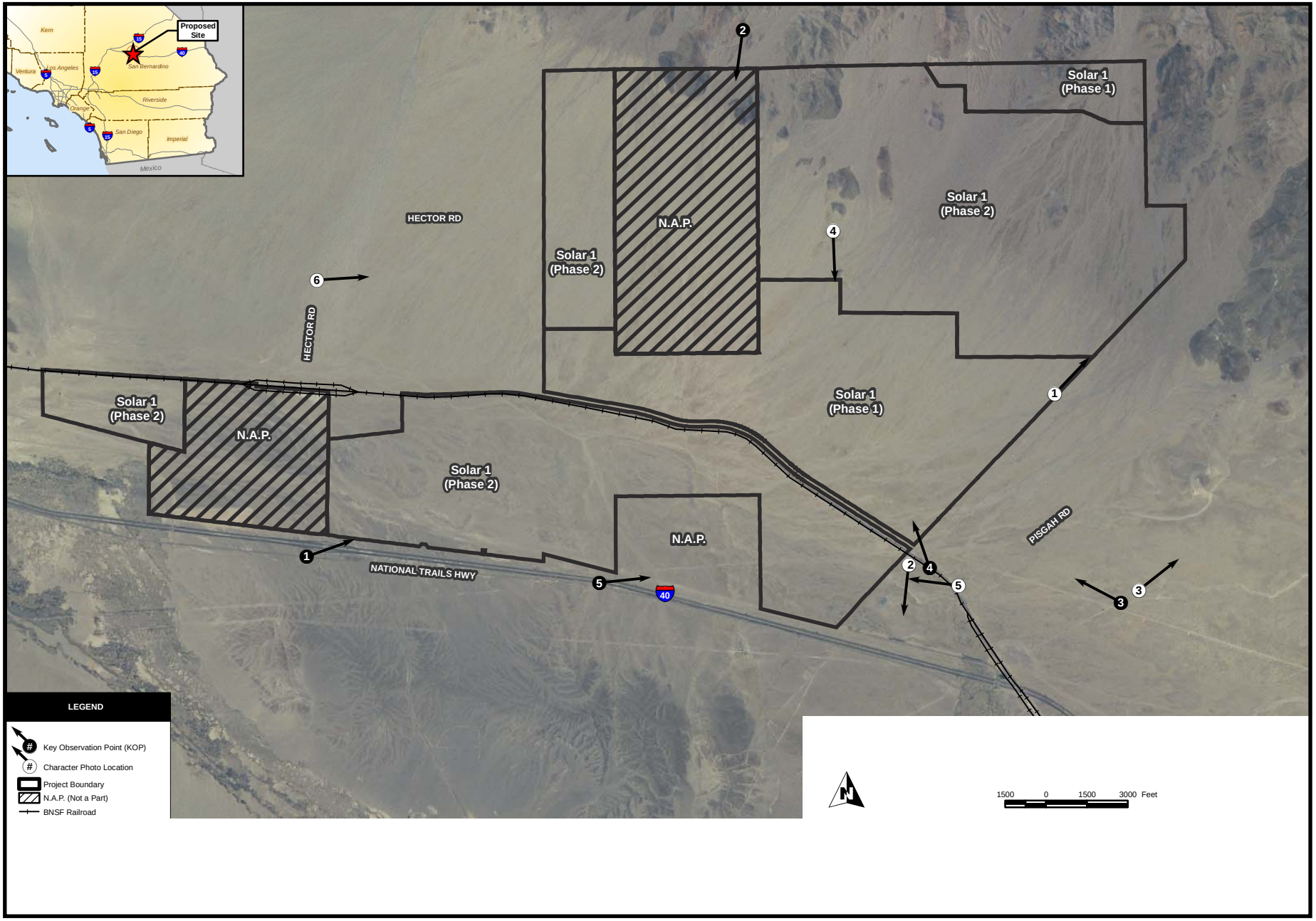



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: URS, BLM, Google, WKA

## VISUAL RESOURCES - FIGURE 4

Calico Solar Project - Key Observation Points (KOPs)



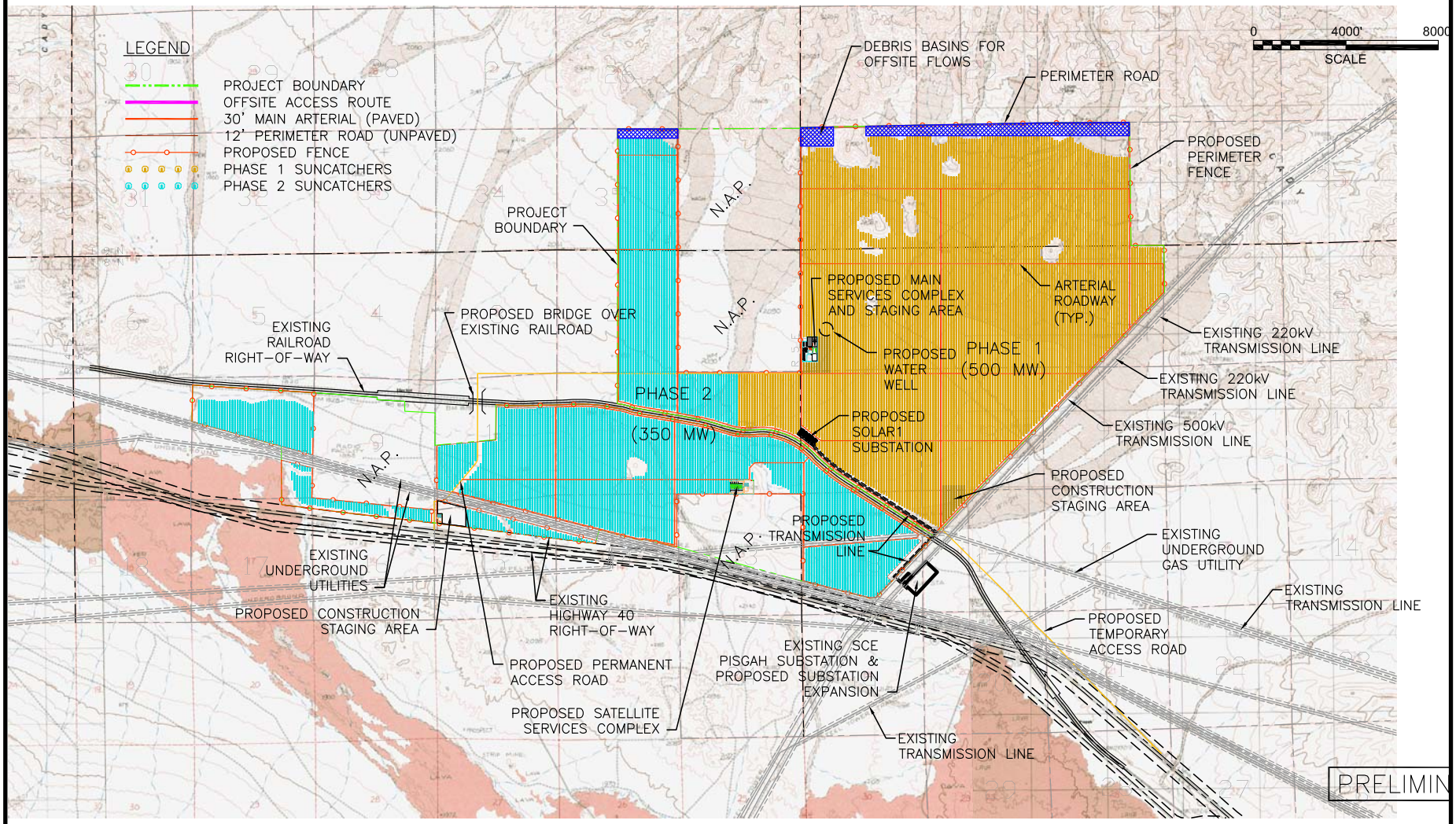



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: AFC Figure 5.13-2

**VISUAL RESOURCES - FIGURE 5**

Calico Solar Project - Project Layout



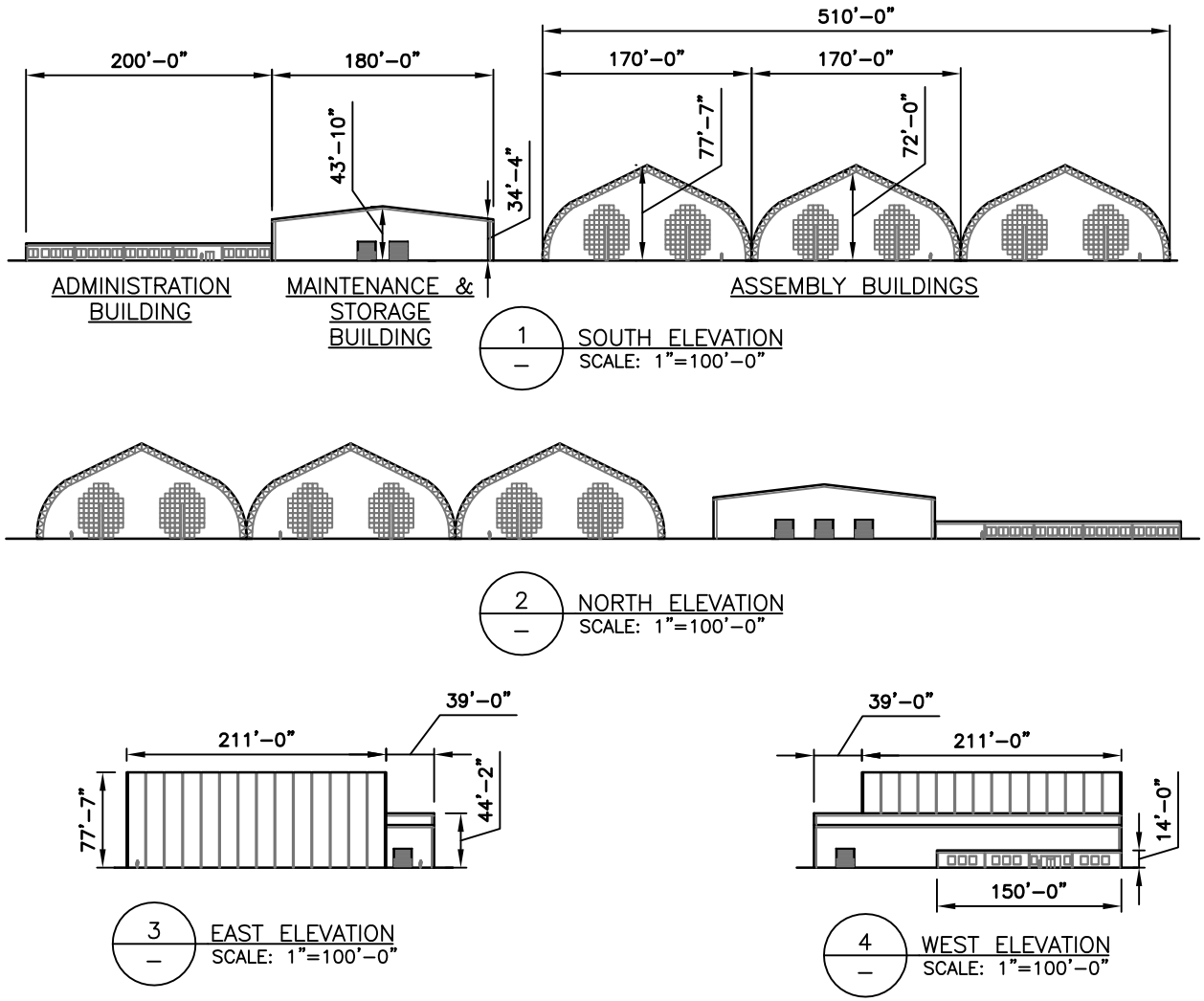





SOURCE: AFC Figure 3-3

**VISUAL RESOURCES - FIGURE 6**

Calico Solar Project - Elevations of Main Services Complex



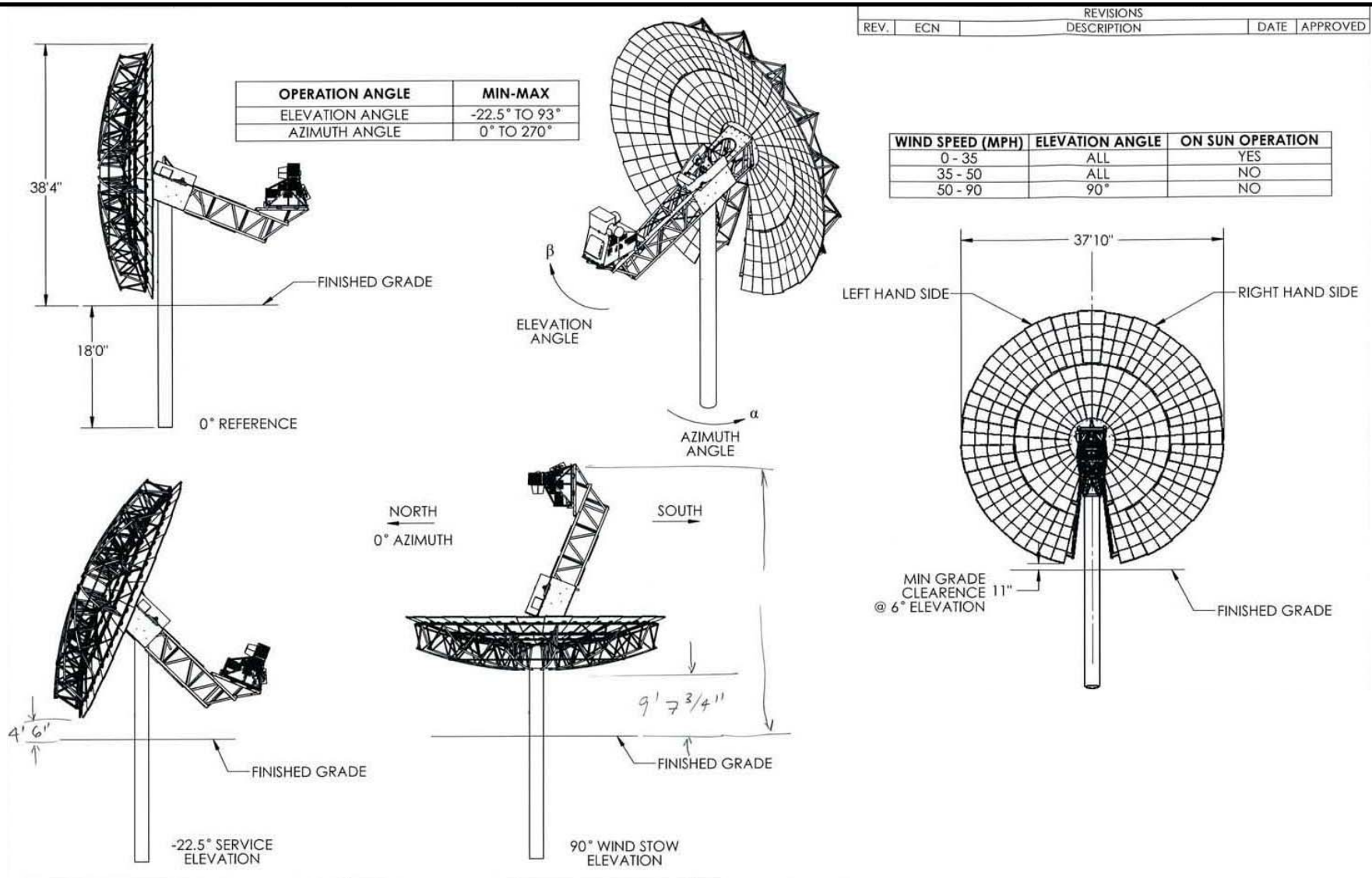



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 3-26

**VISUAL RESOURCES - FIGURE 7**

Calico Solar Project - Elevations of Sun Catchers








SOURCE: Calico Solar, LLC.

**VISUAL RESOURCES - FIGURE 8A**

Calico Solar Project - Existing View of Project Site from KOP 1 - Route 66/I-40



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-11

**VISUAL RESOURCES - FIGURE 8B**

Calico Solar Project - Simulated View of Project Site from KOP 1 - Route 66/I-40



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-12

**VISUAL RESOURCES - FIGURE 9A**

Calico Solar Project - Existing View of Project Site from KOP 2 - Cady Mountains WSA



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-13

**VISUAL RESOURCES - FIGURE 9B**

Calico Solar Project - Simulated View of Project Site from KOP 2 - Cady Mountains WSA



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-14

**VISUAL RESOURCES - FIGURE 10A**

Calico Solar Project - Existing View of Project Site from KOP 3 - Eastside View

MARCH 2010

VISUAL RESOURCES

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SOURCE: AFC Figure 5.13-15

**VISUAL RESOURCES - FIGURE 10B**

Calico Solar Project - Simulated View of Project Site from KOP 3 - Eastside View





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SOURCE: AFC Figure 5.13-16

**VISUAL RESOURCES - FIGURE 11A**

Calico Solar Project - Existing View of Project Site from KOP 4 - BNSF Railroad and I-40 West





**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-17

**VISUAL RESOURCES - FIGURE 11B**

Calico Solar Project - Simulated View of Project Site from KOP 4 - BNSF Railroad and I-40 West





SOURCE: AFC Figure 5.13-18

**VISUAL RESOURCES - FIGURE 12A**

Calico Solar Project - Existing View of Project Site from KOP 5 - Interstate 40 Eastbound





**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-19

**VISUAL RESOURCES - FIGURE 12B**

Calico Solar Project - Simulated View of Project Site from KOP 5 - Interstate 40 Eastbound



**CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010**

SOURCE: AFC Figure 5.13-20

# C.14 – WASTE MANAGEMENT

Testimony of Ellen Townsend-Hough

## C.14.1 SUMMARY OF CONCLUSIONS

Management of the waste generated during construction and operation of the Calico Solar Project (formerly the Stirling Energy Systems Solar One Project) would not generate a significant impact under the California Environmental Quality Act guidelines or NEPA. There is sufficient landfill capacity, and the project would be consistent with the applicable waste management laws, ordinances, regulations, and standards if the measures proposed in the Application for Certification and staff's proposed conditions of certification are implemented, all of which are integrated into the proposed action that was evaluated by BLM under NEPA. Similar to the proposed project, staff considers project compliance with California Environmental Quality Act guidelines (Appendix G: Environmental Checklist Section XVI-Utilities and Service Systems); applicable waste management laws, ordinances, regulations, and standards; and staff's conditions of certification to be sufficient to ensure that no significant impacts would occur as a result of waste management associated with the Reduced Acreage Alternative, Avoidance of Donated and Acquired Lands Alternative and the No Project/No Action Alternative. Southern California Edison's transmission upgrades would comply with all applicable laws, ordinances, regulations, and standards regulating the management of hazardous and non-hazardous and non-hazardous waste during both construction and operation. Implementing mitigation measures similar to the Conditions of Certification that are proposed in the Calico Solar Project Staff Assessment/Draft Environmental Statement for construction and operation would avoid impacts to construction workers and the environment if applied to the Southern California Edison transmission upgrade options.

## C.14.2 INTRODUCTION

This section presents an analysis of issues associated with wastes generated from the proposed construction and operation of the Calico Solar Project. The technical scope of this analysis encompasses solid and liquid wastes existing on site and wastes that would likely be generated during facility construction and operation. Management and discharge of wastewater is addressed in the **SOIL AND WATER RESOURCES** section of this document. Additional information related to waste management may also be covered in the **WORKER SAFETY** and **HAZARDOUS MATERIALS MANAGEMENT** sections of this document.

The Bureau of Land Management (BLM) and Energy Commission staff's (hereafter jointly referred to as staff) objectives in conducting this waste management analysis are to ensure that:

- the management of project wastes would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project would be managed in an environmentally safe manner.
- the disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities.

- upon project completion, the site is managed in such a way that project wastes and waste constituents would not pose a significant risk to humans or the environment.

## C.14.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

In accordance with California Environmental Quality Act (CEQA) guidelines (Appendix G: Environmental Checklist Section XVI – Utilities and Service Systems), staff evaluated project wastes in terms of landfill capacity and LORS compliance. The following federal, state, and local environmental laws, ordinances, regulations, and standards (LORS) have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment, and absent any unusual circumstances, compliance would be sufficient to ensure that no significant impacts would occur as a result of project waste management.

**Waste Management Table 1**
**Laws, Ordinances, Regulations, and Standards (LORS)**

| Applicable Law | Description |
|---|---|
| **Federal** | |
| Title 42, United States Code (U.S.C.), §6901, et seq.<br><br>Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.) | The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions.<br><br>RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing:<br>• Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition;<br>• Waste labeling practices and use of appropriate containers;<br>• Use of a manifest when transporting wastes;<br>• Submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and<br>• Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities.<br><br>RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills.<br><br>RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9) implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii. |

| Applicable Law | Description |
|---|---|
| Title 42, U.S.C., §9601, et seq.<br><br>Comprehensive Environmental Response, Compensation and Liability Act | The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as *Superfund*, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses:<br>• Reporting requirements for releases of hazardous substances;<br>• Requirements for remedial action at closed or abandoned hazardous waste sites, and brownfields;<br>• Liability of persons responsible for releases of hazardous substances or waste; and<br>• Requirements for property owners/potential buyers to conduct "all appropriate inquiries" into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site, and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA "all appropriate inquiries" requirements. |
| Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes | These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes.<br>• Part 257 addresses the criteria for classification of solid waste disposal facilities and practices.<br>• Part 258 addresses the criteria for municipal solid waste landfills.<br>• Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps).<br>U.S. EPA implements the regulations at the federal level. However, California is an RCRA-authorized state, so most of the solid and hazardous waste regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA. |
| Title 49, CFR, Parts 172 and 173.<br><br>Hazardous Materials Regulations | These regulations address the United States Department of Transportation (DOT) established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste manifests in accordance with Title 40, CFR, section 262.20. |
| Federal CWA, 33 USC § 1251 *et seq.* | The Clean Water Act controls discharge of wastewater to the surface waters of the U.S. |

| Applicable Law | Description |
|---|---|
| Title 40 CFR Section 112 | This establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974.<br><br>Subpart B - The Spill Prevention, Control and Countermeasures (SPCC) Plan includes procedures, methods, and equipment at the facility to prevent discharges of petroleum from reaching navigable waters. |
| **State** | |
| California Health and Safety Code (HSC), Chapter 6.5, §25100, et seq.<br><br>Hazardous Waste Control Act of 1972, as amended | This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements.<br><br>The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level. |
| Title 22, California Code of Regulations (CCR), Division 4.5.<br><br>Environmental Health Standards for the Management of Hazardous Waste | These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting the waste off site; and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters.<br><br>The standards addressed by Title 22, CCR include:<br><br>• Identification and Listing of Hazardous Waste (Chapter 11, §66261.1, et seq.).<br>• Standards Applicable to Generator of Hazardous Waste (Chapter 12, §66262.10, et seq.).<br>• Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §66263.10, et seq.).<br>• Standards for Universal Waste Management (Chapter 23, §66273.1, et seq.).<br>• Standards for the Management of Used Oil (Chapter 29, §66279.1, et seq.).<br>• Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §67450.1, et seq.).<br><br>The Title 22 regulations are established and enforced at the state level by DTSC. Some generator and waste treatment standards are also enforced at the local level by CUPAs. |

| Applicable Law | Description |
|---|---|
| HSC, Chapter 6.11 §§25404 – 25404.9<br><br>Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) | The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below.<br>• Aboveground Petroleum Storage Act requirements for Spill Prevention, Control, and Countermeasure (SPCC) Plans.<br>• Hazardous Materials Release and Response Plans and Inventories (Business Plans).<br>• California Accidental Release Prevention (CalARP) Program.<br>• Hazardous Materials Management Plan / Hazardous Materials Inventory Statements.<br>• Hazardous Waste Generator / Tiered Permitting Program.<br>• Underground Storage Tank Program.<br>The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as CUPAs. The DTSC's Calexico Field Office is the CUPA for the Calico Solar Project.<br>Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program. |
| Title 27, CCR, Division 1, Subdivision 4, Chapter 1, §15100, et seq.<br><br>Unified Hazardous Waste and Hazardous Materials Management Regulatory Program | While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses.<br>• Article 9 – Unified Program Standardized Forms and Formats (§§ 15400–15410).<br>• Article 10 – Business Reporting to CUPAs (§§15600–15620). |
| Public Resources Code, Division 30, §40000, et seq.<br><br>California Integrated Waste Management Act of 1989 | The California Integrated Waste Management Act (CIWMA) establishes mandates and standards for management of solid waste in California. The law addresses solid waste landfill diversion requirements; establishes the preferred waste management hierarchy (source reduction first, then recycling and reuse, and treatment and disposal last); sets standards for design and construction of municipal landfills; and addresses programs for county waste management plans and local implementation of solid waste requirements. |

| Applicable Law | Description |
|---|---|
| Title 14, CCR, Division 7, §17200, et seq.<br><br>California Integrated Waste Management Board | These regulations implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions.<br>• Chapter 3 – Minimum Standards for Solid Waste Handling and Disposal.<br>• Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste.<br>• Chapter 7 – Special Waste Standards.<br>• Chapter 8 – Used Oil Recycling Program.<br>• Chapter 8.2 – Electronic Waste Recovery and Recycling. |
| HSC, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq.<br><br>Hazardous Waste Source Reduction and Management Review Act of 1989 | This law was enacted to expand the state's hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (approximately 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a 4-year cycle, with a summary progress report due to DTSC every fourth year. |
| Title 22, CCR, §67100.1 et seq.<br><br>Hazardous Waste Source Reduction and Management Review | These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review elements and reporting requirements to be completed by generators subject to the act. |
| Title 23, CCR Division 3, Chapters 16 and 18 | These regulations relate to hazardous material storage and petroleum UST cleanup, as well as hazardous waste generator permitting, handling, and storage. The DTSC San Bernardino County CUPA is responsible for local enforcement. |
| **Local** | |
| County of San Bernardino General Plan | The General Plan ensures all new development complies with applicable provisions of the County Integrated Solid Waste Management Plan. |
| San Bernardino County, Countywide Integrated Waste Management Plan | This document sets forth the county's goals, policies, and programs for reducing dependence on landfilling solid wastes and increasing source reduction, recycling, and reuse of products and waste, in compliance with the CIWMA. The plan also addresses the siting and development of recycling and disposal facilities and programs within the county. |

## C.14.4 PROPOSED PROJECT

## C.14.4.1 SETTING AND EXISTING CONDITIONS

**Proposed Project**

The proposed Calico Solar Project site is approximately 8,230 acres of Bureau of Land Management (BLM) land located in San Bernardino County, California (SES 2008f page 3-3). The site is located on Hector Road north of Interstate 40, 17 miles east of Newberry Springs and 115 miles east of Los Angeles, California in the Mojave Desert (SES 2008f page 1-1). The project consists of 29 contiguous parcels (SES 2008f Appendix T). The Burlington Northern Santa Fe (BNSF) railroad bisects the site from west to east (SES 2008f 3-22).

The proposed project would utilize SunCatchers – 40-foot tall Stirling dish technology developed by the applicant – which track the sun and focus solar energy onto Power Conversion Units (PCU) (SES 2008f 3-2). The dish assembly collects and focuses solar energy onto the PCU to generate electricity. Each PCU consists of a solar receiver heat exchanger and a closed-cycle, high-efficiency Solar Stirling Engine specifically designed to convert solar power to rotary power via a thermal conversion process. The engine drives an electrical generator to produce grid-quality electricity.

Phase I would be limited to 275 MW, with the remaining 575 MW as part of Phase II. There would be four laydown areas, two laydown areas for each phase of the project. One is a 26-acre laydown site located on the southeast corner of Phase I and the second will be 14 acres located adjacent to the Main Services Complex. The Phase II portion of the project will also have two laydown areas, 26 and 11 acres, located north of Interstate 40 (I-40) and next to the Satellite Services Complex, respectively. In addition to the proposed Calico Solar Project site and construction areas, there are other features and facilities associated with the proposed project (the majority of which are located on the proposed project site or construction laydown area), including:

- Approximately 34,000 SunCatchers and associated equipment and infrastructure within a fenced boundary;
- An onsite, 14.4-acre Main Services Complex located in the north eastern portion of the Phase I section of the project site for administration and maintenance activities. The complex would include buildings, parking and access roads (SES 2008f page 3-62 and Figure 3-4);
- An onsite, 10-acre Satellite Services Complex located in the eastern portion of the Phase II section of the project site for maintenance activities and SunCatcher mirror washing. The complex would include buildings, parking and access roads (SES 2008f page 3-62 and Figure 3-4); and
- An onsite, 2.8-acre 850-MW Calico Solar Project Substation located in the southern portion of the Phase I section of the site (SES 2008f page 3-62 and Figure3-4).

## C.14.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This waste management analysis addresses: a) existing project site conditions and the potential for contamination associated with prior activities on or near the project site, and b) the impacts from the generation and management of wastes during project construction and operation.

**Existing Project Site Conditions and Potential for Contamination**

For any site in California proposed for the construction of a power plant, the applicant must provide documentation about the nature of any potential or existing releases of hazardous substances or contamination at the site. If potential or existing releases or contamination at the site are identified, the significance of the release or contamination would be determined by site-specific factors, including, but not limited to: the amount and concentration of contaminants or contamination; the proposed use of the area where the contaminants/contamination is found; and any potential pathways for workers, the public, or sensitive species or environmental areas to be exposed to the contaminants. Any unmitigated contamination or releases of hazardous substances that pose a risk to human health or environmental receptors would be considered significant by Energy Commission staff.

As a first step in documenting existing site conditions, the Energy Commission's power plant site certification regulations require that a Phase I Environmental Site Assessment (ESA) be prepared[1] and submitted as part of an AFC. The Phase I ESA is conducted to identify any conditions indicative of releases and threatened releases of hazardous substances at the site and to identify any areas known to be contaminated (or a source of contamination) on or near the site.

In general, the Phase I ESA uses a qualified environmental professional to conduct inquiries into past uses and ownership of the property, research hazardous substance releases and hazardous waste disposal at the site and within a certain distance of the site, and visually inspect the property, making observations about the potential for contamination and possible areas of concern. After conducting all necessary file reviews, interviews, and site observations, the environmental professional then provides findings about the environmental conditions at the site. In addition, since the Phase I ESA does not include sampling or testing, the environmental professional may also give an opinion about the potential need for any additional investigation. Additional investigation may be needed, for example, if there were significant gaps in the information available about the site, an ongoing release is suspected, or to confirm an existing environmental condition.

If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.

[1] Title 20, California Code of Regulations, section 1704(c) and Appendix B, section (g)(12)(A). Note that the Phase I ESA must be prepared according to American Society for Testing and Materials protocol or an equivalent method agreed upon by the applicant and the Energy Commission staff.

In conducting its assessment of a proposed project, staff will review the project's Phase I ESA and work with the appropriate oversight agencies as necessary to determine if additional site characterization work is needed and if any mitigation is necessary at the site to ensure protection of human health and the environment from any hazardous substance releases or contamination identified.

**Impacts from Generation and Management of Wastes during Construction, Operation and Project Closure/Decommissioning**

As mentioned previously, staff considers project waste management to result in no significant impacts (as defined per CEQA guidelines in Checklist Section XVI) if there is available landfill capacity and the project complies with LORS. Staff reviewed the applicant's proposed solid and hazardous waste management methods during project construction, operation, and closure/decommissioning, and determined if the methods proposed are consistent with the LORS identified for waste disposal and recycling. Staff also reviewed the capacity available at off-site treatment and disposal sites and determined whether or not the proposed power plant's waste would impact the available capacity.

## C.14.4.3 DIRECT/INDIRECT IMPACTS AND MITIGATION

**Existing Site Conditions**

A Phase I ESA, dated November 14, 2008, was prepared by URS in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs. The Phase I ESA addressed conditions on the Calico Solar Project site located near Hector Road north of Interstate 17 east of Newberry Springs, San Bernardino County, California 92365 and is included as Appendix T of the project AFC. The ESA did not identify any Recognized Environmental Conditions (RECs) in connection with historic or current site operations. A REC is the presence or likely presence of any hazardous substances or petroleum products on a property under the conditions that indicated an existing release, past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or in the ground, groundwater, or surface water of the property.

The Phase I ESA was prepared for 29 contiguous parcels totaling approximately 8,328 acres of vacant, undeveloped BLM desert land and privately owned land. There are three parcels which total 98 acres of privately owned land that are within the project boundaries that are not part of the project. The site is bisected by the BNSF railroad easement. There is a former rock crusher/ore processing area located in the northeastern corner of the site. The processing area was once a part of Logan Mine (SES 2008f, Appendix T and Tessera Solar 2009g, Data Response 88). The Logan Mine produced primarily manganese and iron with trace production of phosphorus-phosphates, silica and sulfur (SES 2008a, Appendix T and Tessa Solar 2009g, Data Response 89). Staff spoke with George Kenline, senior geologist, County of San Bernardino Land Use Services Division, and verified that manganese and iron ore production and processing were not considered hazardous operations (Kenline 2009). Manganese is a common metal, present in many minerals and in ground water. Naturally occurring manganese ores are not particularly hazardous and are not known to be a carcinogen. Most manganese related health problems have historically been

found as an occupational hazard, from inhalation and/or ingestion with workers that mine and process these ores. Recommendations for people working around mining areas particularly metal mines include dust suppression and or respiratory protection (Springer 2009).

In the event that contamination is identified during any phase of construction, staff proposes Condition of Certification **WASTE-1** which would require that an experienced and qualified Professional Engineer or Professional Geologist be available for consultation in the event contaminated soil is encountered. If contaminated soil is identified, **WASTE-2** would require that the Professional Engineer or Professional Geologist inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the Energy Commission Compliance Project Manager (CPM) and DTSC with findings and recommended actions.

## Proposed Project

### Proposed Project - Construction Impacts and Mitigation

Site preparation and construction of Phases I and II of the proposed Calico Solar Project and its associated facilities would last approximately 48 months and generate both non-hazardous and hazardous wastes in solid and liquid forms (SES 2008f 5.14-1). Before construction can begin, the project owner will be required to develop and implement a Construction Waste Management Plan per proposed Condition of Certification **WASTE-3** to ensure that the waste will be recycled when possible and properly landfilled when necessary.

#### *Non-Hazardous Wastes*

Construction activities (including construction of the substation and portable SunCatcher assembly buildings) would generate an estimated 40 cubic yards per week of non-hazardous solid wastes, consisting of scrap wood, steel, glass, plastic, and paper. Of these items, recyclable materials would be separated and removed as needed to recycling facilities. Non-recyclable materials (insulation, other plastics, food waste, roofing materials, vinyl flooring and base, carpeting, paint containers, packing materials, etc.) would be disposed at a Class III landfill; the Applicant expects emptying of a 40-cubic yard container of non-recyclable waste on a weekly basis during construction of the buildings, and once a month thereafter (SES 2008f, Table 5.14-2). Construction of the substation would generate an estimated 1,050 cubic yards of waste (Tessera Solar 2009z, Data Response 173). The SunCatcher assembly buildings would be removed from the site after construction. Decommissioning and removal of the buildings would generate approximately 80 cubic yards of waste consisting of surplus packing materials, lumber, cardboard, lighting, gaskets, and wiring (Tessera Solar 2009z, Data Response 172). Concrete pads under the buildings would remain after the buildings are removed.

Non-hazardous liquid wastes would be generated during construction, and would include storm water runoff and sanitary waste. Storm water runoff would be managed in accordance with appropriate LORS. Sanitary wastes would be pumped to tanker trucks by licensed contractors for transport to a sanitary water treatment plant. Please see the

**SOIL AND WATER RESOURCES** section of this document for more information on the management of project wastewater.

### *Hazardous Wastes*

During construction, anticipated hazardous wastes include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and spent welding materials. Estimated amounts are 1 cubic yard of empty containers (per week), 200 gallons of oils, solvents, and adhesives (every 90 days), and 20 batteries (per year). Empty hazardous material containers would be returned to the vendor or disposed at a hazardous waste facility; solvents, used oils, paint, oily rags, and adhesives would be recycled or disposed at a hazardous waste facility; and spent batteries would be disposed at a recycling facility (SES 2008f, Table 5.14-2).

The generation of hazardous waste requires a unique hazardous waste generator identification number. The hazardous waste generator number is determined based on site location and therefore, both the construction contractor and the project owner/operator could be considered the generator of hazardous wastes at the site. The project owner would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction, pursuant to proposed Condition of Certification **WASTE-4**. This would ensure compliance with California Code of Regulation Title 22, Division 4.5.

Hazardous waste would be collected in hazardous waste accumulation containers and stored in a laydown area, warehouse/shop area, or storage tank on equipment skids for less than 90 days. The accumulated wastes would then be properly manifested, transported, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods and concluded that all wastes would be disposed of in accordance with all applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by the proposed Condition of Certification **WASTE-5** to notify the Compliance Project Manager (CPM) whenever the owner becomes aware of this action.

Staff has reviewed the proposed waste management methods described in AFC section 5.14.2.1, and in the responses to data requests, and concludes that project construction wastes would be managed in accordance with all applicable LORS.

In the event that construction excavation, grading, or trenching activities for the proposed project encounter potentially contaminated soils, specific waste handling, disposal, or other precautions may be necessary pursuant to hazardous waste management LORS. Staff finds that proposed Conditions of Certification **WASTE-1** and **-2** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would further support compliance with LORS.

## Proposed Project - Construction and Demolition (C&D) Waste Diversion and Mitigation

The Integrated Waste Management Act of 1989 [Assembly Bill (AB) 939, Sher, Chapter 1095, Statutes of 1989] set landfill waste diversion goals of 50% (by 2000) for local jurisdictions. To meet this goal, many jurisdictions require applicants for construction and demolition projects to submit a reuse/recycling plan for at least 50% of C&D materials prior to the issuance of a building or demolition permit. The San Bernardino Integrated Waste management Authority does not have a County Demolition Waste Diversion Program (Tessera Solar 2009g, Data Response 86). While the Calico Solar Project is not responsible to a local jurisdiction staff will require the applicant to meet the 50% waste diversion rate. Adoption of Condition of Certification **WASTE-6** will ensure the applicant meets the waste diversion goals of the C&D program. Staff believes that compliance with proposed Condition of Certification **WASTE-6** would also help ensure that project wastes are managed properly and further reduce potential impacts to local landfills from project wastes.

## Proposed Project - Operation Impacts and Mitigation

The proposed Calico Solar Project would generate both non-hazardous and hazardous wastes in solid and liquid forms under normal operating conditions. Table 5.14-2 of the project AFC gives a summary of the anticipated operation waste streams, estimated waste volumes and generation frequency, and proposed management methods. Before operations can begin, the project owner would be required to develop and implement an Operations Waste Management Plan as required in the proposed Condition of Certification **WASTE-7**. This would ensure that an accurate record is maintained of the project's waste storage, generation, and disposal, and compliance with waste regulations is maintained during operation.

### *Non-Hazardous Solid Wastes*

Non-hazardous solid wastes generated during project operations would consist of glass, paper, wood, plastic, cardboard, deactivated equipment and parts, defective or broken electrical materials, empty non-hazardous containers, and other miscellaneous solid wastes. The project would generate approximately 10 cubic yards of non-hazardous solid waste per week (SES 2008f Table 5.14-3). Such wastes would be recycled to the greatest extent possible, and the remainder would be removed on a regular basis for disposal in a Class III landfill. Non-hazardous oily rags (one 55-gallon drum per month) would be laundered at an authorized recycle facility. Sanitary wastewater solids would be treated with an onsite septic system, and sludge would be delivered to an off-site disposal facility.

### *Non-Hazardous Liquid Wastes*

Non-hazardous liquid wastes would be generated during facility operation and are discussed in the **SOIL AND WATER RESOURCES** section of this document.

### *Hazardous Wastes*

The project owner/operator would be considered the generator of hazardous wastes at the site during facility operations. Therefore, the project owner's unique hazardous waste generator identification number, obtained prior to construction in accordance with

proposed Condition of Certification **WASTE-4**, would be retained and used for hazardous waste generated during facility operation.

Hazardous wastes that may be generated during routine project operation include motor oil and coolant from the PCU, batteries, oily absorbent and spent oil filters, and used hydraulic fluid (SES 2008af p. 5.14-11). In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or cleanup materials that may also require management and disposal as hazardous waste. Proper hazardous material handling and good housekeeping practices would help keep spill wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes Condition of Certification **WASTE-8,** requiring the project owner/operator to document, clean up, and properly manage and dispose of wastes from any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on project hazardous materials management spill reporting, containment, and spill control and countermeasures plan provisions for the project are provided in the **HAZARDOUS MATERIALS MANAGEMENT** section of this document.

The amount of hazardous wastes generated during operation of the Calico Solar Project would be minor, with source reduction and recycling of wastes implemented whenever possible. The hazardous wastes would be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed of at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Title 22, CCR, §66262.10 et seq.). Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-5** to notify the CPM when advised of any such action.

Each solar Stirling engine contains 4 quarts of oil (Tessera Solar 20090z, Data Response 167). The PCU engine oil will be stored in four 150-gallon capacity double-walled storage tanks (Tessera Solar 2009z, Data Response 168). Two tanks will store oil recovered from the PCU's while the oil is waiting to be filtered for re-use in the engine. A Hazardous Materials Business Plan, which outlines hazardous materials handling, storage, spill response, and reporting procedures, will be prepared before construction activities. If a spill or release of hazardous materials should occur during operations, the spill area will be bermed or controlled as quickly as practical to minimize the footprint of the spill. Finally, catch pans will be placed under equipment hose connections to catch potential spills during fueling and servicing (Tessera Solar 2009z, Data Response 169).The Lahontan Regional Water Quality Control Board would require a Spill Prevention, Control and Countermeasure Plan (SPCC) (Tessera Solar 2009z, Data Responses 170 & 171) in accordance with Title 40 CFR, Section 112.

Federal Code of Regulations (40 CFR 112 Subpart B) pertains to the SPCC rule which requires owners or operators of non-transportation-related bulk petroleum storage facilities that have an aggregate aboveground storage capacity greater than 1,320 gallons or a buried storage capacity greater than 42,000 gallons to prepare and maintain a site-specific SPCC Plan for their facility. The Calico Solar Project will have more than 34,000 gallons of oil on site. The SPCC Plan would contain information on

procedures; methods and equipment at the Calico Solar Project that would be in place to prevent discharges of petroleum from reaching navigable waters. The requirements for a SPCC Plan for the project are further discussed in the **HAZARDOUS MATERIALS MANAGEMENT** section of this document.

### Proposed Project - Closure and Decommissioning Impacts and Mitigation

The closure or decommissioning of the Calico Solar Project would produce both hazardous and non-hazardous solid and liquid waste. The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission. Required elements of a facility's closure would be outlined in a facility closure plan as specified in Conditions of Certification **Compliance 11, 12, and 13**. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 12 months (or other period of time agreed to by the CPM) prior to commencement of closure activities. The facility closure plan will document non-hazardous and hazardous waste management practices including: the inventory, management, and disposal of hazardous materials and wastes, and permanent disposal of permitted hazardous materials and waste storage units.

The handling and management of waste generated by the Calico Solar Project will follow the hierarchical approach of source reduction, recycling, treatment, and disposal as specified in California Public Resources Code Sections 40051 and 40196. The first priority of the project owner will be to use materials that reduce the waste that is generated. The next level of waste management will involve reusing or recycling wastes. For wastes that cannot be recycled, treatment will be used, if possible, to make the waste nonhazardous. Finally, waste that cannot be reused, recycled or treated would be transported off site to a permitted treatment, storage, or disposal facility. Staff expects that there will be adequate landfill capacity available to dispose of both non-hazardous and hazardous waste from the closure or decommissioning of the proposed project. Conditions of Certification **WASTE-3** through **-8** would continue to apply to the Calico Solar Project during closure or decommissioning of the project.

### Proposed Project - Impact on Existing Waste Disposal Facilities

#### *Non-Hazardous Solid Wastes*

Construction and operation of the proposed project would respectively generate 41 cubic yards and 10 cubic yards per week of nonhazardous solid waste (wood, paper/cardboard, glass, plastic, insulation, and concrete), respectively. The waste would be stored onsite for less than 30 days, and then recycled or disposed of in a Class III landfill.

Table 5.14-1 of the project AFC identifies four waste disposal facilities in San Bernardino County that could potentially take the non-hazardous construction and operation wastes generated by the Calico Solar Project. The remaining combined

capacity of the four landfill facilities that are currently operating is over 93 million cubic yards Table 5.14-1. The total amount of non-hazardous solid waste generated from project construction is estimated to be 7,872 cubic yards (41 cubic yards per week for 48 months), and the total amount from lifetime operations is estimated to be 20,800 cubic yards (10 cubic yards per week for 40 years). These quantities include both recyclable and non-recyclable wastes; Additional non-recyclable sanitary sludge (the non-liquid portion of 5,000 gallons of wastewater per month during operation) and saltcake (90,200 pounds per year of operation) would also be disposed off-site (SES 2008f Table 5.14-3). The total non-recyclable solid waste would contribute much less than 1% of the available landfill capacity. Staff finds that disposal of the solid wastes generated by the Calico Solar Project can occur without significantly impacting the capacity or remaining life of any of these facilities.

### *Hazardous Wastes*

AFC Table 5.14-1 lists landfills and recycling facilities that could be used to manage project wastes. Two hazardous waste (Class I) disposal facilities are currently accepting waste and could be used to manage Calico Solar Project wastes: the Clean Harbors Buttonwillow Landfill in Kern County and the Chemical Waste Management Kettleman Hills Landfill in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is a combined excess of 16 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with at least 30 years remaining in their operating lifetimes (EEC2006a, Section 8.14.3.5.2). In addition, the Kettleman Hills facility is in the process of permitting an additional 4.6 to 4.9 million cubic yards of disposal capacity (Waste Management 2009), and the Buttonwillow facility has 40 years to reach its capacity at its current disposal rate (CEC2008aa).

Hazardous wastes generated during construction and operation would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility. As calculated from waste streams presented in AFC Tables 5.14-2 and 5.14-3 (SES

2008f), staff calculated that approximately 225 cubic yards of recyclable and non-recyclable hazardous waste would be generated over the 48 month construction period. Approximately 50 cubic yards of hazardous non-recyclable waste would be generated over the 40-year operating lifetime. Thus hazardous wastes from the Calico Solar Project requiring off-site disposal would be significantly less than the remaining capacity of either Class 1 waste facility.

## C.14.4.3 CEQA LEVEL OF SIGNIFICANCE

Absent any unusual circumstances, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no significant impacts (per guidelines in CEQA Appendix G: Environmental Checklist Section XVI – Utilities and Service systems) would occur as a result of project waste management.

## C.14.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage alternative would essentially be a 275 MW solar facility located within the central portion of the proposed 850 MW project. It was developed because it

could be constructed without the necessity of a new 500 kV transmission line, and would avoid several other environmental impacts. This alternative's boundaries and the revised locations of the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 1**.

## C.14.5.1 SETTING AND EXISTING CONDITIONS

The general setting and existing conditions would remain as described in C.14.4.1 although the land requirements would be proportionately reduced to reflect the smaller project size. Locations of laydown areas may also vary.

## C.14.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The Reduced Acreage Alternative would generate similar types of hazardous and non-hazardous wastes from construction, demolition and operation of the project. However, the quantities of waste would be reduced by 66%. The amount of non-hazardous and hazardous solid wastes generated under a Reduced Acreage Alternative that would require landfill/treatment would be approximately 3,000 and 74 cubic yards, respectively. Similar to the proposed project, wastes requiring off-site disposal would be significantly less than the remaining capacity of off-site disposal facilities. Similar to the proposed project, staff will not require investigation and remediation of soil and groundwater contamination. Disposal methods would remain the same as for the proposed project and the same Conditions of Certification (**WASTE 1 through 8)** would apply.

## C.14.5.3 CEQA LEVEL OF SIGNIFICANCE

Similar to the proposed project, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no significant impacts would occur as a result of waste management associated with the Reduced Acreage Alternative.

## C.14.6 AVOIDANCE OF DONATED AND ACQUIRED LANDS ALTERNATIVE

The Avoidance of Donated and Acquired Lands Alternative would be an approximately 720 MW solar facility located within the boundaries of the proposed 850 MW project. This alternative, the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 2**.

## C.14.6.1 SETTING AND EXISTING CONDITIONS

The general setting and existing conditions would remain as described in C.14.4.1 although the land requirements would be proportionately reduced to reflect the smaller project size. Locations of laydown areas may also vary.

## C.14.6.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The 720 MW Alternative would generate similar types of hazardous and non-hazardous wastes from construction, demolition and operation of the project. However, the quantities of waste would be reduced by 15%. The amount of non-hazardous and hazardous solid wastes generated under a 720 MW Alternative that would require landfill/treatment would be approximately 7,100 and 191 cubic yards, respectively. Similar to the proposed project, wastes requiring off-site disposal would be significantly less than the remaining capacity of off-site disposal facilities. Similar to the proposed project, staff will not require investigation and remediation of soil and groundwater contamination. Disposal methods would remain the same as for the proposed project and the same Conditions of Certification (**WASTE 1 through 8)** would apply.

## C.14.6.3 CEQA LEVEL OF SIGNIFICANCE

Similar to the proposed project, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no significant impacts would occur as a result of waste management associated with the 720 MW Alternative.

## C.14.7 NO PROJECT/NO ACTION ALTERNATIVE

There are three No Project / No Action Alternatives evaluated as follows:

**No Project / No Action Alternative #1: No Action on the Calico Solar Project application and on CDCA land use plan amendment**

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

The result of the No Project / No Action Alternative would be the following:

- The impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan, including another renewable energy project.

If the proposed project is not approved, renewable projects would likely be developed on other sites in San Bernardino County, the Mojave Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and State/Federal mandates. For example, there are dozens of other wind and solar projects that have applications pending with BLM in the California Desert District. There would be no impacts on waste management under this no action alternative.

**No Project / No Action Alternative #2: No Action on the Calico Solar Project and amend the CDCA land use plan to make the area available for future solar development**

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site. However, there would be no impacts on waste management as a result of this no action alternative; any future project would be evaluated for waste management impacts in a project-specific NEPA analysis.

**No Project / No Action Alternative #3: No Action on the Calico Solar Project application and amend the CDCA land use plan to make the area unavailable for future solar development**

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended. There would be no impacts on waste management under this no action alternative.

## C.14.8 PROJECT-RELATED FUTURE ACTIONS - WASTE MANAGEMENT

This section examines the potential impacts of future transmission line construction, line removal, substation expansion, and other upgrades that may be required by Southern California Edison Company (SCE) as a result of the Calico Solar Project. The SCE upgrades are a reasonably foreseeable event if the Calico Solar Project is approved and constructed as proposed.

The SCE project will be fully evaluated in a future EIR/EIS prepared by the BLM and the California Public Utilities Commission. Because no application has yet been submitted and the SCE project is still in the planning stages, the level of impact analysis presented is based on available information. The purpose of this analysis is to inform the Energy Commission and BLM, interested parties, and the general public of the potential environmental and public health effects that may result from other actions related to the Calico Solar Project.

The project components and construction activities associated with these future actions are described in detail in Section B.3 of this Staff Assessment/EIS. This analysis examines the construction and operational impacts of two upgrade scenarios

- The **275 MW Early Interconnection Option** would include upgrades to the existing SCE system that would result in 275 MW of additional latent system capacity. Under the 275 MW Early Interconnection option, Pisgah Substation would be expanded adjacent to the existing substation, one to two new 220 kV structures would be constructed to support the gen-tie from the Calico Solar Project into Pisgah

Substation, and new telecommunication facilities would be installed within existing SCE ROWs.

- The **850 MW Full Build-Out Option** would include replacement of a 67-mile 220 kV SCE transmission line with a new 500 kV line, expansion of the Pisgah Substation at a new location and other telecommunication upgrades to allow for additional transmission system capacity to support the operation of the full Calico Solar Project.

## C.14.8.1 ENVIRONMENTAL SETTING

The environmental setting described herein incorporates both the 275 MW Early Interconnection and the 850 MW Full Build-Out options. The setting for the 275 MW Early Interconnection upgrades at the Pisgah Substation and along the telecomm corridors is included within the larger setting for the project area under the 850 MW Full Build-Out option, which also includes the Lugo-Pisgah transmission corridor.

The transmission lines and related facilities would be routed mostly through undeveloped publicly-owned desert and mountainous land with relatively few activities that could generate hazardous wastes or contaminated areas. In the event that contamination is identified during any phase of construction, staff proposes Conditions of Certification **WASTE-1** and **WASTE-2** which would require that a Professional Engineer or Professional Geologist inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the Energy Commission Compliance Project Manager (CPM) and DTSC with findings and recommended actions.

Under the 850 MW Full Build-Out option, all existing 220 kV structures on the 67-mile Lugo-Pisgah 220 kV transmission line would be removed (more than 250 structures), as well as two existing 500 kV structures on the Lugo–Eldorado transmission line. Transmission line equipment to be removed would include existing 220 kV and 500 kV lattice steel structures and associated hardware (i.e., cross arms, insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotters pins, insulator weights, and bond wires), as well as the transmission line conductor. Steel lattice tower footings, concrete caps and anchors would likely be cut/removed below ground level. Holes would be filled and compressed, and then the area would be smoothed to match surrounding grade. The disposal of or recycling of these structures would occur at permitted facilities.

At the Pisgah Substation, any excavated soil would likely be spread on a portion of the substation property. At the end of construction, all construction materials and debris would be removed from the area and recycled or properly disposed of offsite.

The closest landfills within San Bernardino County near the Pisgah Substation would be the Newberry Springs Medium Volume Transfer/Processing Facility in Newberry Springs (along I-40, approximately 20 miles west of the town of Pisgah), which has a maximum permitted throughput of 15 tons/day and allows Mixed Municipal waste, and the Barstow Sanitary Landfill, which is approximately 3 miles south of Barstow along Highway 247. The Barstow Sanitary Landfill allows a maximum permitted throughput of 750 tons/day, has a remaining capacity of 924,401 cubic yards, and accepts the following waste types:

Agricultural, Construction/demolition, Industrial, Mixed municipal, Other designated, and Sludge (BioSolids). Other landfills along the transmission corridor include the Camp Rock Transfer Station in the Lucerne Valley and four other landfills in the Victorville/Hesperia area (Victorville Sanitary Landfill, Advance Disposal Transfer/Processing Facility, Victor Valley MRF & Transfer Station, and Victor Valley Regional Composting Facility) (CIWMB 2009).

Waste management activities associated with the proposed action would include the storage, transport, recycling, or disposal of all project waste streams. Waste streams generally include solid waste and liquid waste. For the purposes of this analysis, discharges to the atmosphere are not included as waste streams. Atmospheric discharges and air quality are described in the **AIR QUALITY** section. Solid waste would include office type materials (paper, cardboard, newspaper, etc.) and any other solid material that is stored or disposed of as a non hazardous waste. Liquid waste may include human septic waste, process fluid waste, and storm water runoff.

All waste streams are regulated and discharges or disposal of any waste material either requires specific permitting or disposal at a permitted facility based on the type of waste. Both solid and liquid waste streams can be either hazardous or non hazardous, depending on the constituents in the waste stream and the characteristics (ignitability, reactivity, toxicity, and corrosivity) of the waste. The status of the waste stream determines both the storage options for the material, and the disposal method for the material.

Solid waste disposal sites are permitted as either Class III facilities, which accept municipal solid waste, or Class I facilities which accept hazardous waste. Within San Bernardino County, there are seven existing Class III commercial solid waste disposal facilities (CIWMB 2008). The proposed transmission line route has not been reviewed to determine the location of the transmission line relative to existing and proposed solid waste disposal facilities.

Liquid waste disposal facilities include municipal waste water treatment plants and individual sewage disposal systems (ISDS). Municipal waste treatment plants are allowed to receive residential, commercial, and industrial human sewage material, and some regulated industrial liquid waste streams. Residential human sewage waste can also be disposed of in ISDS. Any liquid waste stream that is considered hazardous must be disposed of in a Class I land fill or through a combination of recycling and disposal at a permitted facility.

Uncontrolled solid waste disposal facilities may be present within the proposed transmission line ROW area. These facilities may include historic fill areas associated with urban solid waste disposal, areas of domestic solid waste present on private property, or areas of illegal solid waste disposal on public lands. These types of facilities may or may not be publicly known, mapped, and identified. Public records for these facilities would be reviewed as part of a Phase 1 ESA completed prior to permitting of the project. Unknown areas of solid waste disposal may be encountered during project construction activities.

## C.14.8.2 ENVIRONMENTAL IMPACTS

Construction would generate waste largely in the form of soil from structure/substation excavation, concrete from existing foundations, utility line cable, and scrap metal from the replacement of existing structures. The transmission structures, insulators, cross arms and all other associated hardware would be disposed of at an offsite location. This Staff Assessment/DEIS also discusses impacts in the event contaminated soil is encountered. Hazardous wastes generated during construction and operation would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility.

In addition, although Polychlorinated biphenyls (PCB) have been banned from use with electrical distribution and substation transformers by the U.S. EPA since 1985 (U.S. EPA 2009), some older pieces of electrical equipment within SCE's system may still contain PCBs. There is a likelihood that some PCB containing equipment would need to be removed from some of the project locations during the construction of the project and removal of the existing line. Therefore, there would be a potential for a PCB release to contaminate the environment in the event of a spill while handling and transporting PCBs.

Excavation required to construct the components of the project would primarily be limited to areas at existing and proposed structure locations, at underground fiber optic trench locations, and at the expanded Pisgah Substation locations. A contamination site record search would need to be conducted to determine existing known contaminated sites in the project vicinity. Therefore, it is possible that subsurface construction activities could accidentally disturb documented contamination sites, potentially mobilizing soil and/or groundwater contamination.

Finally, previously undocumented soil and or groundwater contamination could be encountered during tower and pole installation, trenching, grading, or other excavation related activities despite the steps taken to identify and avoid contamination. The applicant would be required to conduct site surveys prior to construction to determine whether these conditions could exist.

The presence of oil in a quantity greater than 1,320 gallons invokes Spill Prevention Control and Countermeasures (SPCC) regulations. The quantity of oil contained in any one of the planned 500/220 kV transformers would be in excess of the minimum quantity that requires such regulations. See **HAZARDOUS MATERIALS** for further discussion on this regulation.

## C.14.8.3 MITIGATION

Mitigation, including preparation of a waste management plan, is recommended that would ensure that all construction materials and debris would be removed from the area and recycled or properly disposed of offsite. Conditions of Certification **WASTE-3** and **WASTE-6** outline proposed construction waste management plans and recycling mitigation methods that should be required. Although impacts to solid waste facilities and waste management would not be significant and no mitigation measure would be required, to further reduce adverse effects of the overall volume of waste from all of the project components, mitigation that would require SCE to recycle construction waste

where feasible is recommended for implementation to ensure that maximum recycling activities would occur over the course of the entire project.

SCE would also be required to properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees, in accordance with state and federal hazardous waste management requirements. Hazardous wastes would be accumulated onsite in accordance with accumulation time limits and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Utilization of portable liquid waste systems (port-a-potties) at all construction locations, including regular maintenance of the facilities, is recommended.

To identify and avoid documented contamination sites relative to the project sites, record searches specifically for the project locations would need to be conducted. Implementation of mitigation measures should require identification and avoidance of documented contamination sites, thus ensuring that the potential impacts caused by documented contaminated sites would be reduced to less than significant levels.

Soils testing should be conducted and analyzed by a professional, licensed Geotechnical Engineer or Geologist, to determine existing soil conditions. Borings in a sufficient quantity to adequately gather variations in the site soils should be conducted to remove sample cores for testing. The type of soils, soil pressure, relative compaction, resistivity, and percolation factor are among the items that should be tested for. If contaminants are encountered, special studies and remediation measures in compliance with environmental regulations should be implemented by qualified professionals.

During trenching, grading, or excavation work, mitigation measures should be developed that would require the contractor to observe the exposed soil for visual evidence of contamination. If visual contamination indicators are observed during construction, the contractor should be required to stop work until the material is properly characterized and appropriate measures are taken to protect human health and the environment. The contractor would also have to comply with the all local, State, and federal requirements for sampling and testing, and subsequent removal, transport, and disposal of hazardous materials. Requiring Conditions of Certification **WASTE-1** and **WASTE-2** would ensure the appropriate measures are taken to mitigate potential impacts due to the presence and disturbance of contaminated soils.

## C.14.8.4 CONCLUSION

SCE transmission upgrades would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both project construction and operation. The Conditions of Certification included in the **WASTE MANAGEMENT** section of this Staff Assessment/DEIS, SCE should be required to recycle construction waste where feasible, and identify potential soil contamination. In addition, the site should be managed such that contaminants would not pose a significant risk to humans or to the environment.

Implementing mitigation measures similar to the Conditions of Certification that are proposed in the Calico Solar Project Staff Assessment/DEIS for construction and operation would avoid impacts to construction workers and environment if applied to the SCE transmission upgrade options.

## C.14.9 CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code Regulation, Title 14, section 15130). NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7).

There is the potential for substantial future development in the San Bernardino Valley area and throughout the southern California desert region. Analysis of cumulative impacts is based on data provided in the following maps and tables (see **CUMULATIVE SCENARIO**):

- Cumulative Impacts Figure 1, Regional Renewable Applications;
- Cumulative Impacts Figure 2, Renewable Applications in the Barstow & Needles District Areas;
- Cumulative Impacts Figure 3, Newberry Springs/Ludow Area - Existing and Future/Foreseeable Projects;
- Cumulative Impacts Table 1, Renewable Energy Projects in the California Desert District
- Cumulative Impacts Table 2, Existing Projects in the Newberry Springs/Ludow Area; and
- Cumulative Impacts Table 3, Future Foreseeable Projects in the Newberry Springs/Ludlow Area.

The analysis in this section first defines the geographic area over which cumulative impacts related to waste management could occur. The cumulative impact analysis itself describes the potential for cumulative impacts to occur as a result of implementation of the Calico Solar Project along with the listed local and regional projects.

### C.14.9.1 GEOGRAPHIC EXTENT

Cumulative impacts can occur within San Bernardino County if implementation of the Calico Solar Project could combine with those of other local or regional projects. Cumulative impacts could also occur as a result of development of some of the many proposed solar and wind development projects that have been or are expected to be under consideration by the BLM and the Energy Commission in the near future. Many of these projects are located within the California Desert Conservation Area, as well as on BLM land in Nevada and Arizona.

The geographic extent for the analysis of the cumulative impacts associated with the Calico Solar Project includes San Bernardino County. This geographic scope is appropriate because waste disposal facilities in San Bernardino County could easily handle all waste generated by the Calico Solar Project.

## C.14.9.2 CUMULATIVE IMPACT ANALYSIS

### Local Projects

The Calico Solar Project would generate non-hazardous solid waste that would add to the total waste generated in San Bernardino County. Non-hazardous solid waste generated by all of the past, present, and reasonably foreseeable projects presented in Cumulative Impacts Table 2 and Cumulative Impacts Table 3 would also be disposed of within San Bernardino County. However, project wastes would be generated in modest quantities, waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. Most of the reasonably foreseeable projects identified in Cumulative Impacts Table 3 would generate smaller volumes of non-hazardous waste than the Calico Solar Project. The total amount of available solid waste landfill capacity in San Bernardino County expected exceeds 93 million cubic yards (SES 2008f Table 5.14-1). Therefore, even if all 11 of these reasonably foreseeable projects were constructed, staff concludes that the non-hazardous waste generated by the Calico Solar Project would not result in significant cumulative waste management impacts.

As stated above, the non-recyclable component of the 225 cubic yards of hazardous construction waste and the less than 50 cubic yards per year of non-recyclable operations waste from the Calico Solar Project would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities. The very small quantities of project hazardous waste and the similarly small quantities of hazardous waste that would potentially be generated by the reasonably foreseeable projects would not result in significant cumulative waste management impacts.

### Regional Projects

Implementation of the multiple solar and wind projects proposed to be developed in southeastern California, southern Nevada, and western Arizona would result in an increase in generation of hazardous and non-hazardous solid and liquid waste and would add to the total quantity of waste generated in the states of California and Nevada. However, project wastes would be generated in modest quantities, waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. Therefore, impacts of the Calico Solar Project, when combined with impacts of the future solar and wind development projects currently proposed within southeastern California, southern Nevada, and western Arizona, would not result in significant and unavoidable cumulative impacts with regard to waste management.

### C.14.9.3 CUMULATIVE IMPACT CONCLUSION

Impacts of the Calico Solar Project would combine with impacts of past, present, and reasonably foreseeable projects to result in a contribution to local and regional cumulative impacts related to waste management.

The amount of non-hazardous and hazardous wastes generated during construction and operation of the Calico Solar Project would add to the total quantity of hazardous and non-hazardous waste generated in San Bernardino County. However, project wastes would be generated in modest quantities, waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. Therefore, staff concludes that the waste generated by the Calico Solar Project would not result in significant cumulative waste management impacts either locally or regionally.

## C.14.10 COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed Calico Solar Project would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The applicant is required to recycle and/or dispose hazardous and non-hazardous wastes at facilities licensed or otherwise approved to accept the wastes.

Because hazardous wastes would be produced during both project construction and operation, the Calico Solar Project would be required to obtain a hazardous waste generator identification number from U.S. EPA. The Calico Solar Project would also be required to properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees, in accordance with state and federal hazardous waste management requirements.

## C.14.11 NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits associated with Waste Management.

## C.14.12 FACILITY CLOSURE

Staff has addressed facility closure and decommissioning impacts to Waste Management under individual headings in Assessment of Impacts and Discussion of Mitigation above. Conditions of Certification **Compliance 11, 12, and 13** also address the requirements for facility closure that would relate to Waste Management.

## C.14.13 PROPOSED CONDITIONS OF CERTIFICATION/APPROVAL

**WASTE-1** The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil and impact public health, safety and the environment.

**Verification:** At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

**WASTE-2** If potentially contaminated soil is identified during site characterization, demolition, excavation or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control or Regional Water Quality Control Board, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control or Regional Water Quality Control Board, for guidance and possible oversight.

**Verification:** The project owner shall submit any reports filed by the professional engineer or professional geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

**WASTE-3** The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct

classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

**Verification:** The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

**WASTE-4** The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.

**Verification:** The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

**WASTE-5** Upon notification of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts, and describe how the violation will be corrected.

**Verification:** The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

**WASTE-6** The project owner shall provide a reuse/recycling plan for at least 50% of construction and demolition materials prior to any building or demolition. The project owner shall ensure compliance and shall provide proof of compliance documentation to the CPM, including a recycling and reuse summary report, receipts, and records of measurement. Project mobilization and construction shall not proceed until the CPM issues an approval document.

**Verification:** At least 60 days prior to the start of any construction or demolition activities, the project owner shall submit a reuse recycling plan to the CPM for review and approval. The project owner shall ensure that project activities are consistent with the approved reuse/recycling plan and provide adequate documentation of the types and volumes of wastes generated, how the wastes were managed, and volumes of wastes diverted. Project mobilization and construction shall not proceed until CPM issues an approval document. Not later than 60 days after completion of project construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM. The required documentation shall include

a recycling and reuse summary report along with all necessary receipts and records of measurement from entities receiving project wastes.

**WASTE-7** The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the proposed project and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

**Verification:** The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

**WASTE-8** The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.

**Verification:** The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

## C.14.14 CONCLUSIONS

Consistent with the three main objectives for staff's waste management analysis (as noted in the Introduction section of this analysis), staff provides the following conclusions:

After review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that construction, demolition, and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and nonrecyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with accumulation time, and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **8**. These conditions would require the project owner to do all of the following:

- Ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight (**WASTE 1** and **2**).
- Prepare Construction Waste Management and Operation Waste Management Plans detailing the types and volumes of wastes to be generated and how wastes will be managed, recycled, and/or disposed of after generation (**WASTE-3** and **7**).
- Obtain a hazardous waste generator identification number (**WASTE-4**).
- Ensure that all spills or releases of hazardous substances are reported and cleaned-up in accordance with all applicable federal, state, and local requirements (**WASTE-8**).
- Comply with waste recycling and diversion requirements (**WASTE-6**).

- Report any waste management-related LORS enforcement actions and how violations will be corrected (**WASTE-5**).

The existing available capacity for the Class III landfills that may be used to manage nonhazardous project wastes exceeds 3.73 million cubic yards, with another 600 million cubic yards of capacity expected in the future with full operation of the Mesquite Regional Landfill. The total amount of non-hazardous wastes generated from construction, demolition and operation of the Calico Solar Project would contribute much less than 1% of the projected landfill capacity. Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity.

In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of Calico Solar Project have a combined remaining capacity in excess of 16 million cubic yards, with another 4.6 to 4.9 million cubic yards of proposed capacity. The total amount of hazardous wastes generated by the Calico Solar Project would be less than significant in relation to the remaining permitted capacity. Therefore, impacts from disposal of Calico Solar Project generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills.

Staff concludes that management of the waste generated during construction and operation of the Calico Solar Project would not result in any significant adverse impacts, and would comply with applicable LORS, if the waste management practices and mitigation measures proposed in the Calico Solar Project AFC and staff's proposed conditions of certification are implemented.

## C.14.15 REFERENCES


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CEC 2008l – Energy Commission staff's Issues Identification Report. November 17, 2008.

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Kenline 2010 – George Kenline, Senior Geologist, County of San Bernardino, Land Use Services Department, December 30, 2009 discussed Logan Mine operation and hazards of manganese mining operations.

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Tessera Solar 2009l – Applicants' Response to CEC & BLM Data Requests 113-127 CEC Data Requests Set 1, Part 2 (tn: 52956), August 20, 2009.

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Tessera Solar 2009bb – Applicant's Updated Project Map (tn: 54427), December 10, 2009.

Waste Management 2009 – Kettleman Hills Facility Project Update. <http://www.kettlemanhillsfacts.com/project_update.html>

# C.15 – WORKER SAFETY AND FIRE PROTECTION

Testimony of Rick Tyler and Alvin J. Greenberg, Ph.D.

## C.15.1 SUMMARY OF CONCLUSIONS

BLM and Energy Commission Staff (hereafter referred to as staff) conclude that if the applicant for the proposed Calico Solar Project (formerly the Stirling Energy Systems Solar One Project) provides project construction safety and health and project operations and maintenance safety and health programs, as required by conditions of certification **WORKER SAFETY-1, -2, -3, -4, -5, -6,** and **-7**, the project would incorporate sufficient measures to both ensure adequate levels of industrial safety and comply with applicable laws, ordinances, regulations, and standards. These proposed conditions of certification ensure that these programs, proposed by the applicant, will be reviewed by the appropriate agencies before they are implemented. The conditions also require verification that the proposed plans adequately ensure worker safety and fire protection and comply with applicable laws, ordinances, regulations, and standards. Therefore, with mitigation, no adverse impacts to worker safety and fire protection are expected under CEQA or NEPA.

Staff has also determined that the project will have a significant impact on the local fire protection services. The proposed facility would be located in an area that is currently served by the San Bernardino County Fire Department (SBCFD). While staff believes that the SBCFD is adequately staffed, trained, and equipped to respond to a fire, hazardous materials spill, or a need for Emergency Medical Services in a reasonable time period given the great distances involved in a desert location, the added emergency response needs will pose significant added demands on local fire protection services, thus resulting in shifting equipment and personal from station to station to cover the entire county (the largest county in California and in the continental United States) and therefore staff proposes Condition of Certification **WORKER SAFETY-6** as mitigation to reduce the impacts to less than significant.

## C.15.2 INTRODUCTION

Worker safety and fire protection are regulated through federal, state, and local laws, ordinances, regulations, and standards (LORS). Industrial workers at the facility both operate equipment and handle hazardous materials daily, and could face hazards resulting in accidents and serious injury. Protection measures are employed to eliminate or reduce these hazards or minimize their risk through special training, protective equipment, and procedural controls. The purpose of this **WORKER SAFETY AND FIRE PROTECTION** section of this Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) is to assess the worker safety and fire protection measures proposed by the Calico Solar applicant and determine whether the applicant has proposed adequate measures to:

- Comply with applicable safety LORS;
- Protect workers during the construction and operation of the facility;
- Protect against fire; and
- Provide adequate emergency response procedures.

## C.15.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

## C.15.3.1 LAWS, ORDINANCES, REGULATION, AND STANDARDS

**Worker Safety and Fire Protection Table 1**
**Laws, Ordinances, Regulations, and Standards**

| Applicable Law | Description |
|---|---|
| **Federal** | |
| 29 U.S. Code sections 651 et seq. (Occupational Safety and Health Act of 1970) | This Act mandates safety requirements in the workplace, with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651). |
| 29 CFR sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations) | These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. |
| 29 CFR sections 1952.170 to 1952.175 | These sections provide federal approval of California's plan for enforcement of its own safety and health requirements, in lieu of most of the federal requirements found in 29 CFR §1910.1 to 1910.1500. |
| **State** | |
| 2007 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9) | NFPA standards are incorporated into the California State Fire Code. The fire code contains general provisions for fire safety, including road and building access, water supplies, fire protection and life safety systems, fire-resistive construction, storage of combustible materials, exits and emergency escapes, and fire alarm systems. |
| Title 24, California Code of Regulations (24 CCR § 3, et seq.) | The California Building Code is comprised of 11 parts containing building design and construction requirements as they relate to fire, life, and structural safety. It incorporates current editions of the International Building Code, including the electrical, mechanical, energy, and fire codes applicable to the project. |
| 8 CCR all applicable sections (Cal/OSHA regulations) | Requires that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during the construction, commissioning, and operation of power plants, as well as safety around electrical components, fire safety, and hazardous materials usage, storage, and handling. |
| 24 CCR section 3, et seq. | Incorporates the current edition of the International Building Code. |
| Health and Safety Code sections 25500 to 25541 | Requires a Hazardous Materials Business plan detailing emergency response plans for hazardous materials emergencies at a facility. |

| Applicable Law | Description |
|---|---|
| **Local (or locally enforced)** | |
| Fire and Hazardous Materials: San Bernardino County Code, Title 2, Division 3, Chapter 1 et seq. | Includes California Fire Code and specific codes to regulate permits activities and administrative penalties. Adopts the 2007 California Fire Code and adopts State requirements and guidelines as governing hazardous materials release response plans and inventories. |
| Health and Safety: San Bernardino County Code Title 3, Division 1, et seq. | Includes specific codes to regulate permits, activities (e.g., solid waste management), and administrative penalties. |
| Building and Construction: San Bernardino County Code, Title 6, Division 3, Chapter 1 et seq. | Adopts national standards such as Uniform Building Code and National Electrical Code. |

## C.15.4 PROPOSED PROJECT

### C.15.4.1 SETTING

The proposed Calico Solar Project site is approximately 8,230 acres of Bureau of Land Management (BLM) land located in San Bernardino County, California (SES 2008f page 3-3). The site is located on Hector Road north of Interstate 40, 17 miles east of Newberry Springs, about 37 miles east of Barstow, and 115 miles east of Los Angeles, California in the Mojave Desert (SES 2008a). The project consists of 29 contiguous parcels and the Burlington Northern Santa Fe (BNSF) railroad bisects the site from west to east. The project would be located in an undeveloped part of San Bernardino County adjacent to Interstate 40; lands in this part of the Mojave Desert are managed predominantly by the Bureau of Land Management (BLM). Land uses in the vicinity of the proposed project include transportation use, open space, and resource conservation (SES 2008a, Section 5.9.1). There are a total of three residences within a 3-mile radius of the proposed site, the nearest of which is located approximately 1,300 feet south of the property boundary on the other side of I-40. There are no sensitive receptors in the vicinity of the project site (SES 2008a, Section 5.16.1 and Figure 5.16-1).

The site elevation slopes gently to the northeast and ranges from 1,925 to 3,050 feet above sea level (SES 2008a, Section 5.2). Topography in the vicinity of the project is varied in elevation, with regions of elevated terrain existing mostly to the north and east, where the sloping grade continues beyond the project boundary (SES 2008a, Section 5.2.1 and Figure 5.2-1).

The proposed project would utilize SunCatchers — 40-foot-tall Stirling dish technology developed by the applicant — which track the sun and focus solar energy onto Power Conversion Units (PCU). The dish assembly collects and focuses solar energy onto the PCU to generate electricity. Each PCU consists of a solar receiver heat exchanger and

a closed-cycle, high-efficiency Solar Stirling Engine specifically designed to convert solar power to rotary power via a thermal conversion process. The engine drives an electrical generator to produce grid-quality electricity.

Fire support services to the site would be under the jurisdiction of the San Bernardino County Fire Department (SBCFD). However, the nearest fire station is that of Newberry Springs Fire Department and the applicant has stated that "emergency services will be coordinated" with that fire district (SES 2008a, page 5.17-14). Staff believes that the proper jurisdiction is the SBCFD and that all emergency services should be coordinated with San Bernardino County. The applicant appears to agree with staff's opinion in that the AFC also states that the SBCFD "will provide primary fire protection, fire fighting, and emergency response services to the Project Site (SES 2008 a, page 5.17-17).

There are a total of twenty fire stations within the SBCFD North Desert Division, the closest of which would be the Harvard and Amboy stations. The response time can range from 40 minutes to no response if they are unavailable. In addition to the SBCFD stations and that of Newberry, the Barstow Fire Protection District located about 37 miles away would respond to the Calico site though a mutual aid agreement. All personnel at the SBCFD are trained as Emergency Medical Technicians (EMT) Level-1 and as first responders to hazardous materials incidents. The large majority of personnel are also trained paramedics (SBCFD 2010).

The applicant has stated that certain plant personnel would be trained as a hazardous materials response team and that one or more spill response kits would be available on-site. In the event of a large incident involving hazardous materials, backup support would be provided by the SBCFD which has a hazmat response unit capable of handling any incident at the proposed Calico site. The SBCFD Hazmat unit is located at Station #322 in Adelanto, about one hour away.

Staff has reviewed the response times for fire, HazMat release, and EMS and has found them to be acceptable given the remote location of the Calico facility.

In addition to construction and operations worker safety issues, the potential exists for exposure to contaminated soil during site preparation. A Phase I Environmental Site Assessment (ESA), dated November 14, 2008, was prepared by URS in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs. The ESA did not identify any "Recognized Environmental Conditions". That is, there was no evidence or record of any use, spillage, or disposal of hazardous substances on the site, nor was there any other environmental concern that would require remedial action. To address the unlikely possibility that soil contamination would be encountered during construction of the Calico Solar Project, proposed Conditions of Certification **Waste-1** and **Waste-2** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **WASTE MANAGEMENT** for a more detailed analysis of this topic.

## C.15.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

**Method and Threshold for Determining Significance**

Two issues are assessed in **WORKER SAFETY AND FIRE PROTECTION:**

1. The potential for impacts on the safety of workers during demolition, construction, operations, and closure and decommissioning activities; and
2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, operations, and closure and decommissioning activities.

Worker safety is essentially a LORS compliance matter and if all LORS are followed, workers will be adequately protected. Thus, the standard for staff's review and determination of significant impacts on worker health is whether the applicant has demonstrated adequate knowledge of and commitment to implementation of all pertinent and relevant Cal-OSHA standards.

Staff reviews and evaluates the on-site fire-fighting systems proposed by the applicant, as well as the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the Calico Solar Project site. If on-site systems do not follow established codes and industry standards, staff recommends additional measures. Staff reviews local fire department capabilities and response times. If Staff determines that the presence of the power plant would cause a significant impact on a local fire department. Staff will recommend that the applicant mitigate this impact.

## DIRECT/INDIRECT IMPACTS AND MITIGATION

**Proposed Project Worker Safety**

Industrial environments are potentially dangerous during both construction and operation. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress. Workers may sustain falls, trips, burns, lacerations, and other injuries. They may be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks or electrocution. It is important that the Calico Solar Project has well-defined policies and procedures, training, and hazard recognition and control to minimize these hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation of the project. "Safety and Health Program," for staff, refers to measures that will be taken to ensure compliance with the applicable LORS during the construction and operation of the project.

### Construction Safety and Health Program

The Calico Solar Project includes the construction and operation of a Stirling solar power plant. The project will present construction risks and operational risks to workers typical of other solar power projects. In addition the facility will pose risks associated

with use of hydrogen as a working gas. The risk to workers is minimized through onsite generation (which reduces storage of hydrogen) and through rigorous safety management practices required by applicable LORS.

Construction safety orders are published at Title 8 of the California Code of Regulations, section 1502 et seq. These requirements are promulgated by Cal/OSHA and apply to the construction phase of the project. The construction safety and health program will include the following:

- Construction injury and illness prevention program (8 CCR § 1509);
- Construction fire prevention plan (8 CCR § 1920);
- Personal protective equipment program (8 CCR §§ 1514–1522); and
- Emergency action program and plan.

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will include:

- Electrical safety program;
- Motor vehicle and heavy equipment safety program;
- Forklift operation program;
- Excavation/trenching program;
- Fall protection program;
- Scaffolding/ladder safety program;
- Articulating boom platforms program;
- Crane and material handling program;
- Housekeeping and material handling and storage program;
- Respiratory protection program;
- Employee exposure monitoring program;
- Hand and portable power tool safety program;
- Hearing conservation program;
- Back injury prevention program;
- Hazard communication program;
- Heat and cold stress monitoring and control program;
- Pressure vessel and pipeline safety program;
- Hazardous waste program;
- Hot work safety program;
- Permit-required confined space entry program; and
- Demolition procedure (if applicable).

The AFC includes adequate outlines for each of the above programs (SES 2008a). Prior to the project's start of construction, detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-1**.

### Operations and Maintenance Safety and Health Program

Prior to the start-up of the Calico Solar Project, an operations and maintenance safety and health program will be prepared. This program will include the following programs and plans:

- Injury and illness prevention program (8 CCR § 3203);
- Fire prevention program (8 CCR § 3221);
- Personal protective equipment program (8 CCR §§ 3401 to 3411); and
- Emergency action plan (8 CCR § 3220).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will apply to this project. Written safety programs for the Calico Solar Project, which the applicant will develop, will ensure compliance with those requirements.

The AFC includes adequate outlines for an injury and illness prevention program, an emergency action plan, a fire prevention program, and a personal protective equipment program (SES 2008a). Prior to operation of the Calico Solar Project, all detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-2**.

### Safety and Health Program Elements

As mentioned above, the applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

#### *Injury and Illness Prevention Program (IIPP)*

The IIPP will include the following components (BSE2007a, section 5.16.4.4):

- Identify persons with the authority and responsibility for implementing the program;
- Establish the safety and health policy of the plan;
- Define work rules and safe work practices for construction activities;
- Establish a system for ensuring that employees comply with safe and healthy work practices;
- Establish a system to facilitate employer-employee communication;
- Develop procedures for identifying and evaluating workplace hazards and establish necessary program(s);
- Establish methods for correcting unhealthy/unsafe conditions in a timely manner;
- Determine and establish training and instruction requirements and programs;

- Specify safety procedures; and
- Provide training and instruction.

### *Fire Prevention Plan*

The California Code of Regulations requires an operations fire prevention plan (8 CCR § 3221). The AFC outlines a proposed fire prevention plan that is acceptable to staff (SOLAR 2007a, section 6.18.3.1). The plan will include the following:

- Determine general program requirements;
- Determine fire hazard inventory, including ignition sources and mitigation;
- Develop good housekeeping practices and proper materials storage;
- Establish employee alarms and/or communication system(s);
- Provide portable fire extinguishers at appropriate site locations;
- Locate fixed firefighting equipment in suitable areas;
- Specify fire control requirements and procedures;
- Establish proper flammable and combustible liquid storage facilities;
- Identify the location and use of flammable and combustible liquids;
- Provide proper dispensing and determine disposal requirements for flammable liquids;
- Establish and determine training and instruction requirements and programs; and
- Identify contacts for information on plan contents.

Staff proposes that the applicant submit a final fire prevention plan to the California Energy Commission compliance project manager (CPM) for review and approval and to the SBCFD for review and comment to satisfy proposed conditions of certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.

### *Personal Protective Equipment Program*

California regulations require personal protective equipment (PPE) and first aid supplies whenever hazards in the environment, or from chemicals or mechanical irritants, could cause injury or impair bodily function through absorption, inhalation, or physical contact (8 CCR sections 3380 to 3400). The Calico Solar Project operational environment will require PPE.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and will carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information about protective clothing and equipment:

- Proper use, maintenance, and storage;
- When protective clothing and equipment are used;
- Benefits and limitations; and
- When and how protective clothing and equipment are replaced.

The PPE program ensures that employers comply with applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential hazards in the workplace, and will be required as per proposed Conditions of Certification **WORKER SAFETY-1 and -2**.

### *Emergency Action Plan*

California regulations require an emergency action plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (SES 2008a).

The outline lists the following features:

- Establishes emergency procedures for the protection of personnel, equipment, the environment, and materials;
- Identifies fire and emergency reporting procedures;
- Determines response actions for accidents involving personnel and/or property;
- Develops response and reporting requirements for bomb threats;
- Specifies site assembly and emergency evacuation route procedures;
- Defines natural disaster responses (for example, earthquakes, high winds, and flooding);
- Establishes reporting and notification procedures for emergencies (including on-site, off-site, local authorities, and/or state jurisdictions);
- Determines alarm and communication systems needed for specific operations;
- Includes a spill response, prevention, and countermeasure (SPCC) plan;
- Identifies emergency personnel (response team) responsibilities and notification roster;
- Specifies emergency response equipment and strategic locations; and
- Establishes and determines training and instruction requirements and programs.

An emergency action plan is required by applicable LORS and Staff's proposed Conditions of Certification **WORKER SAFETY-1 and -2**

### *Written Safety Program*

In addition to the specific plans listed above, additional LORS called "safe work practices" apply to the project. Both the construction and operations safety programs will address safe work practices in a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading "Construction Safety and Health Program" in this staff assessment.

In addition, the project owner would be required to provide personnel protective equipment and exposure monitoring for workers involved in activities where contaminated soil and/or contaminated groundwater exist, per staff's proposed Conditions of Certification **WORKER SAFETY-1** and**-2**.

These proposed conditions of certification ensure that workers are properly protected from any hazardous wastes at the site.

### *Safety Training Programs*

Employees will be trained in the safe work practices described in the above-referenced safety programs.

### Additional Safety Issues

This solar power plant will present a unique work environment that includes a solar field located in the high desert. The area under the solar arrays must be kept free from weeds and thus herbicides will be applied as necessary. Exposure to workers via inhalation and ingestion of dusts containing herbicides poses a health risk. Finally, workers will regularly inspect the solar array for broken or non-functioning mirrors by driving up and down dirt paths between the rows of mirrors and even under the mirrors. Cleaning and servicing the mirrors will also be conducted on a routine schedule. All these activities will take place year-round and especially during the summer months of peak solar power generation, when outside ambient temperatures routinely reach 115°F and above.

### Additional Safety Issues

This solar power plant will present a unique work environment that includes a solar field located in the high desert. The area under the SunCatchers must be kept free from weeds and thus herbicides will be applied as necessary. Exposure to workers via inhalation and ingestion of dusts containing herbicides poses a health risk. Finally, workers will inspect the SunCatcher arrays for hydrogen leaks and broken apparatus on a frequent basis by driving up and down dirt paths between the rows of solar catchers. Cleaning the SunCatchers will also be conducted on a routine schedule. All these activities will take place year-round and especially during the summer months of peak solar power generation, when outside ambient temperatures routinely reach 115 °F and above.

The applicant has indicated that workers will be adequately trained and protected, but has not included specific precautions against heat stress and exposure to herbicides. Therefore, to ensure that workers are indeed protected, staff has proposed additional requirements to proposed Conditions of Certification **WORKER SAFETY-1** and **2**. These requirements consist of the following provisions:

- A worker heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395) requiring heat illness prevention; and
- The development and implementation of Best Management Practices (BMP) for the storage and application of herbicides used to control weeds beneath and around the solar array.
- All herbicide applications would comply with the Record of Decision for BLM's Programmatic EIS for Vegetation Treatments Using Herbicides on Bureau of Land

Management Lands in 17 Western States (see http://www.blm.gov/wo/st/en/prog/more/veg_eis.html). Only herbicides approved in that ROD would be used, and all herbicide use would comply with the use protocol, consultation requirements, monitoring requirements, and standard operating procedures listed therein.

Staff believes that effective implementation of a Heat Stress Protection Plan will mitigate the potential for significant risks to workers from heat during both construction and operations. A BMP requiring proper herbicide storage and application will mitigate potential risks to workers from exposure to herbicides and reduce the chance that herbicides will contaminate either surface water or groundwater. Staff suggests that a BMP follow either the guidelines established by the U.S. EPA (EPA 1993), or more recent guidelines established by the State of California or U.S. EPA.

**Additional Mitigation Measures**

Protecting construction workers from injury and disease is one of the greatest challenges today in occupational safety and health. The following facts are reported by NIOSH:

- More than seven million persons work in the construction industry, representing 6% of the labor force. Approximately 1.5 million of these workers are self-employed;
- Of approximately 600,000 construction companies, 90% employ fewer than 20 workers. Few have formal safety and health programs;
- From 1980-1993, an average of 1,079 construction workers were killed on the job each year, with more fatal injuries than any other industry;
- Falls caused 3,859 construction worker fatalities, or 25.6% of the total, between 1980 and 1993;
- 15% of workers' compensation costs are spent on construction-related injuries;
- Ensuring safety and health in construction is a complex task involving short-term work sites, changing hazards, and multiple operations and crews working in close proximity to one another;
- In 1990, Congress directed NIOSH to conduct research and training to reduce diseases and injury among construction workers in the United States. Under this mandate, NIOSH funds both intramural and extramural research projects.

The hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex industrial projects like gas-fired power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a construction safety supervisor to ensure a safe and healthful environment for all workers. This has been evident in the audits of power plants recently conducted by the staff. The Federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as construction safety supervisors, construction health and safety officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors to improve their safety and health performance; to assist them in striving to eliminate the four major construction hazards (falls, electrical, caught in/between, and struck-by hazards) that account for the majority of fatalities and injuries

in this industry and have been the focus of targeted OSHA inspections; to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and to recognize subcontractors that have exemplary safety and health programs.

There are no OSHA or Cal-OSHA requirements that an employer hire or provide for a construction safety officer. OSHA and Cal-OSHA regulations do, however, require that safety be provided by an employer and the term “Competent Person” appears in many OSHA and Cal-OSHA standards, documents, and directives. A “Competent Person” is defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, in order to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes Condition of Certification **WORKER SAFETY-3,** which would require the applicant/project owner to designate and provide for a project site construction safety supervisor.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex industrial projects like power plants.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past because of both the failure to recognize and control safety hazards and the inability to adequately monitor compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits, conducted in 2005, at several power plants under construction. The findings of the audit include, but are not limited to, safety oversights like:

- Lack of posted confined-space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to the commissioning team, and then to operations;
- Dangerous placement of hydraulic elevated platforms under one another;
- Inappropriate placement of fire extinguishers near hotwork;
- Dangerous placement of numerous power cords in standing water on the site, increasing the risk of electrocution;
- Inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility, but too close to the perimeter fence; and
- Lack of adequate employee or contractor written training programs that address the proper procedures to follow in the event of the discovery of suspicious packages or objects either onsite or offsite.

In order to reduce and/or eliminate these hazards, it is necessary for the Energy Commission to require a professional Safety Monitor on-site to track compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to the operations staff. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner but reporting to the Chief Building Official (CBO) and the Compliance Project Manager (CPM), will serve as an extra set of eyes to ensure that safety procedures and practices are fully implemented during construction at all power plants certified by the Energy Commission. During audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged them in questions about the team's findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provides a "fresh perspective" of the site.

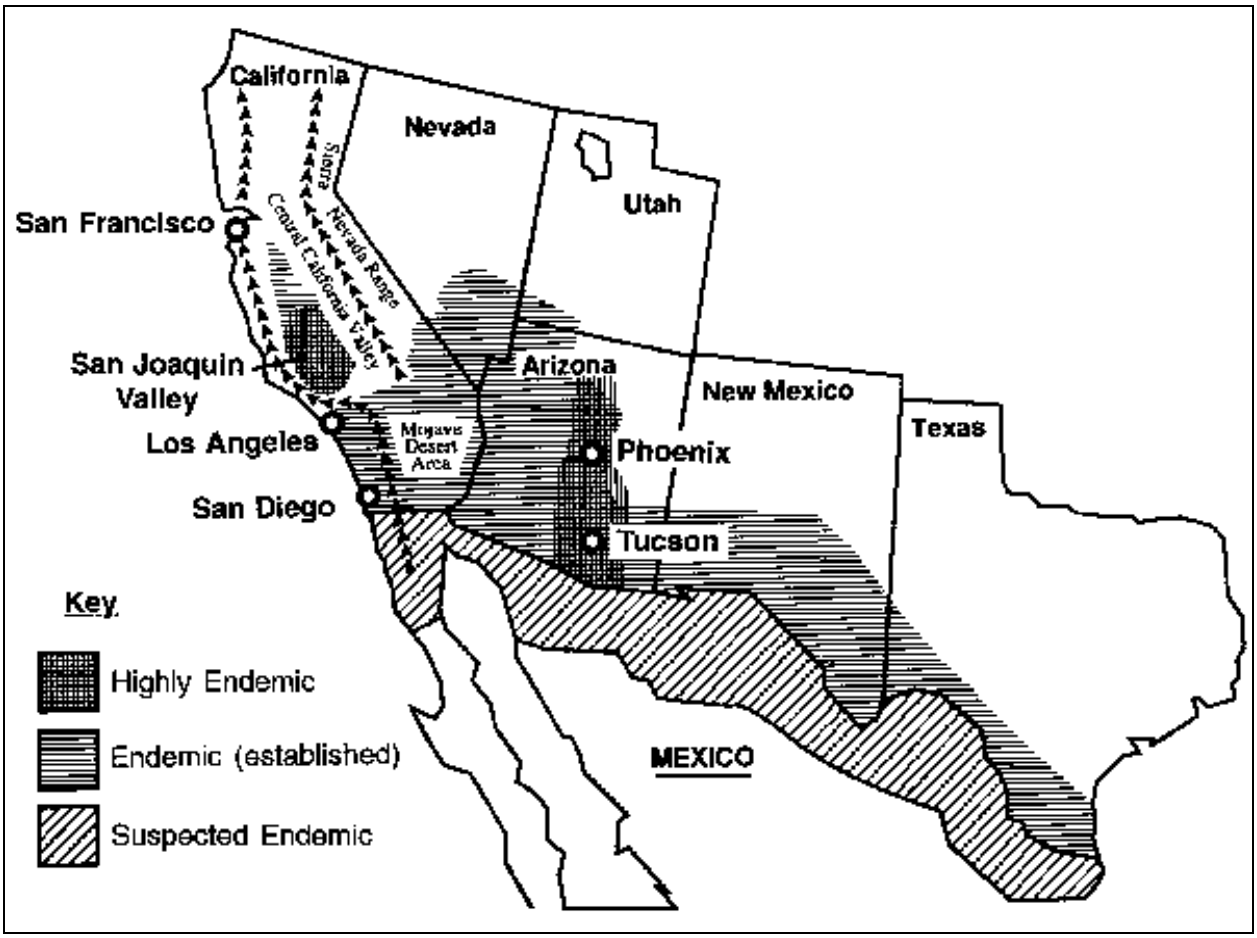
### *Valley Fever (Coccidioidomycosis)*

Coccidioidomycosis or "Valley Fever" (VF) is primarily encountered in southwestern states, particularly in Arizona and California. It is caused by inhaling the spores of the fungus *Coccidioides immitis*, which are released from the soil during soil disturbance (e.g., during construction activities) or wind erosion. The disease usually affects the lungs and can have potentially severe consequences, especially in at-risk individuals such as the elderly, pregnant women, and people with compromised immune systems. Trenching, excavation, and construction workers are often the most exposed population. Treatment usually includes rest and antifungal medications. No effective vaccine currently exists for Valley Fever. VF is endemic to the San Joaquin Valley in California, which presumably gave this disease its common name. Kern County, located at the southern end of San Joaquin valley, is where valley fever occurs most frequently (Valley Fever Vaccine Project of the Americas 2010; KCDPH 2008). While the area where the highest rate was found is that part of Kern County to the west of the Sierra Nevada-Tehachapi Range, the eastern side along with the Mojave Desert in San Bernardino County experiences high rates as well. The proposed Calico project will be in located in the Mojave Desert part of San Bernardino County and thus staff feels that the following discussion which focuses on Kern County is applicable to this project site as well.

In 1991, 1,200 cases of VF were reported to the California Department of Health Services (CDHS) compared with an annual average of 428 cases per year for the period of 1981 to 1990. In 1992, 4,516 cases were reported in California, and 4,137 cases in 1993. Seventy percent of VF cases were reported from Kern County (CDC 1994; Flaherman 2007; CDHS 2010).

A 2004 CDC report found that the number of reported cases of coccidioidomycosis in the US increased by 32% during 2003-2004, with the majority of these cases occurring in California and Arizona. The report attributed these increases to changes in land use, demographics, and climate in endemic areas, although certain cases might be attributable to increased physician awareness and testing (CDC 2006). According to the CDC Morbidity and Mortality Weekly Report of February 2009, incidences of valley fever have increased steadily in Arizona and California in the past decade. Cases of coccidioidomycosis averaged about 2.5 per 100,000 population annually from 1995 to 2000 and increased to 8.0 per

**Worker Safety Figure 1**
**Geographic Distribution of Coccidioidomycosis**

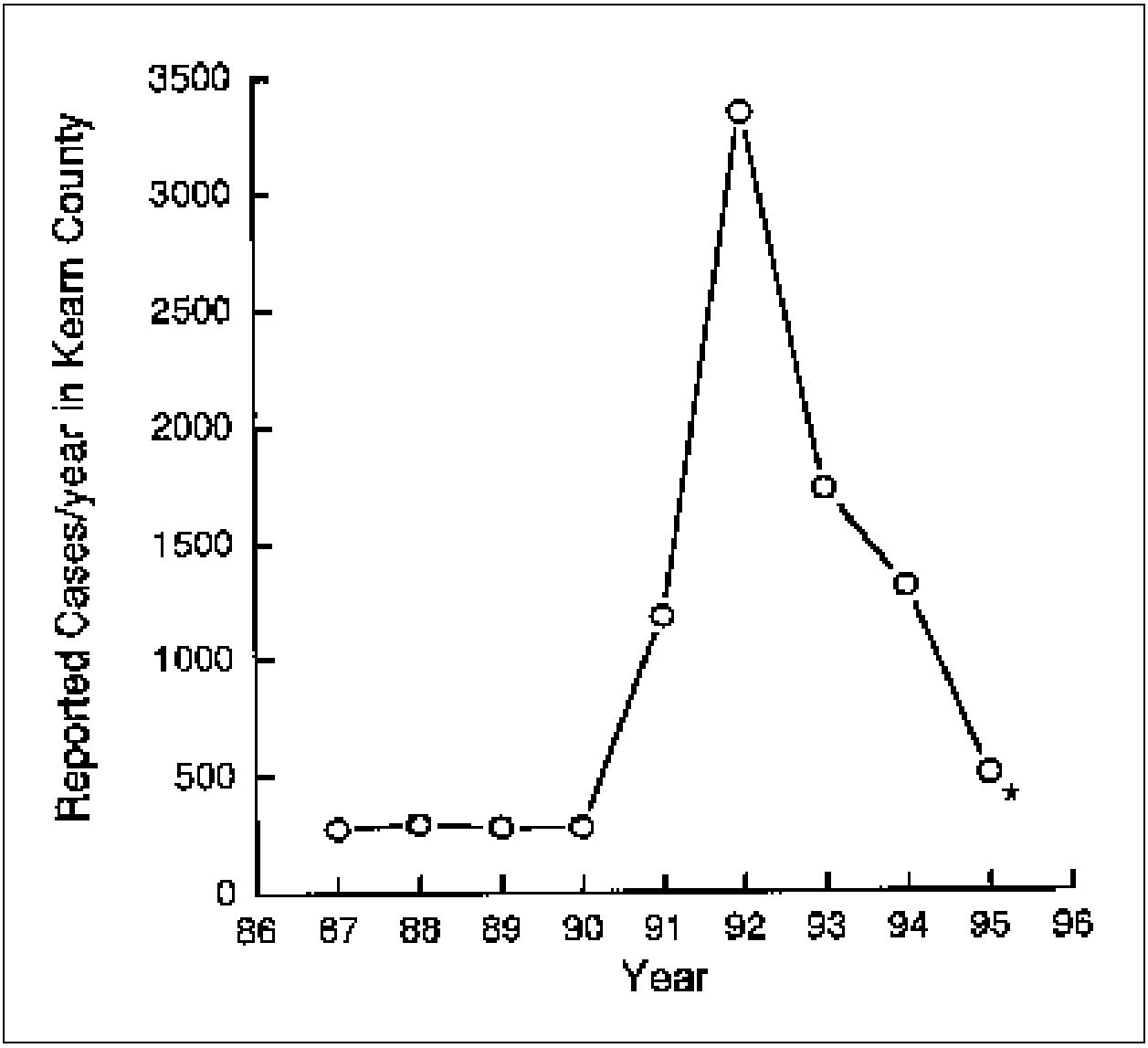



Source: CDC 2006, Figure 2

100,000 population between 2000 and 2006 (incidence rates tripled). In 2007 there was a slight drop in cases, but the rate was still the highest it has been since 1995. The report identified Kern County as having the highest incidence rates (150.0 cases per 100,000 population), and non-Hispanic blacks having the highest hospitalization rates (7.5 per 100,000 population). In addition, between the years 2000 and 2006, the number of valley fever related hospitalizations climbed from 1.8 to 4.3 per 100,000 population (611 cases in 2000 to 1,587 cases in 2006) and then decreased to 1,368 cases in 2007 (3.6 per 100,000 population). Overall in California, during 2000-2007, a total of 752 (8.7%) of the 8,657 persons hospitalized for coccidioidomycosis died (CDC 2009).

A 2007 study published in the Emerging Infectious Diseases journal of the Center for Disease Control and Prevention (CDC), found the frequency of hospitalization for coccidioidomycosis in the entire state of California to be 3.7 per 100,000 residents per year for the period between 1997 and 2002 (see Table 2 below). There were 417 deaths from VF in California in those years, resulting in a mortality rate of 2.1 per 1 million California residents annually. The data shows that Kern County had the highest total number and highest frequency of hospitalizations (Flaherman 2007).

**Worker Safety Figure 2**
**Number of Coccidioidomycosis Cases Identified by Serologic Testing at the Kern County Public Health Laboratory between 1986 and 1996**




Source: CDC 2006, Figure 4

**Worker Safety Table 2**
**Hospitalizations for Coccidioidomycosis, California, 1997–2002**

| Category | Total Hospitalizations | Total Person-Years ($\times 10^6$) | Frequency of Hospitalization[1] | Frequency of Hospitalization for Coccidioidal Meningitis[1] |
|---|---|---|---|---|
| Total | 7,457 | 203.0 | 3.67 | 0.657 |
| **Year** | | | | |
| 1997 | 1,269 | 32.5 | 3.90 | 0.706 |
| 1998 | 1,144 | 32.9 | 3.50 | 0.706 |
| 1999 | 1,167 | 33.4 | 3.5 | 0.61 |
| 2000 | 1,100 | 34.0 | 3.23 | 0.62 |
| 2001 | 1,291 | 34.7 | 3.7 | 0.58 |
| 2002 | 1,486 | 35.3 | 4.2 | 0.71 |
| **Highest Incidence Counties** | | | | |
| Kern | 1,700 | 3.97 | 42.8 | |
| Tulare | 479 | 2.21 | 21.7 | |
| Kings | 133 | 0.77 | 17.4 | |
| SLO | 170 | 1.48 | 11.5 | |

Notes:
1 - Per 100,000 residents per year
Source: Flaherman 2007

A 1996 paper that tried to explain the sudden increase in Coccidioidomycosis cases that began in the early 1990s found that the San Joaquin Valley in California has the largest population of *C. immitis*, which is found to be distributed unevenly in the soil and seems to be concentrated around animal burrows and ancient Indian burial sites. It is usually found 4 to 12 inches below the surface of the soil (CDC 2006). The paper also reported that incidences of coccidioidomycosis vary with the seasons; with highest rates in late summer and early fall when the soil is dry and the crops are harvested. Dust storms are frequently followed by outbreaks of coccidioidomycosis (CDC 2006). A modeling attempt to establish the relationship between fluctuations in VF incidence rates and weather conditions in Kern County found that there is only a weak connection between weather and VF cases (weather patterns correlate with up to 4% of outbreaks). The study concluded that the factors that cause fluctuations in VF cases are not weather-related but rather biological and anthropogenic (i.e. human activities, primarily construction on previously undisturbed soil) (Talamantes 2007).

Data from the Kern County Department of Public Health (KCDPH) on the period between 1995 and 2008 shows that VF cases increased in Kern County during the early 1990's, decreased during the late 1990's, increased again between 2000 and 2005, and have been declining slightly in the last several years. The majority of VF cases are recorded in the Bakersfield area where 50 to 70 percent of all Kern County VF cases occur. Delano, Lamont, and Taft have the next highest recorded incidences of VF. With the exception of the year 2004 when 26 cases of VF were reported in the Ridgecrest area,

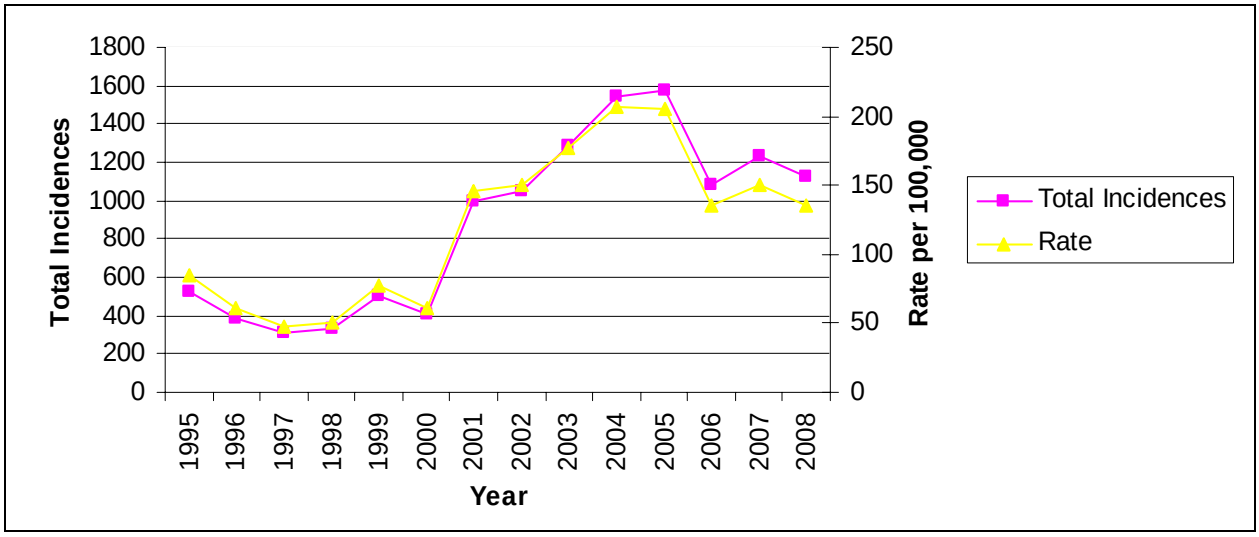
less than 15 cases have been recorded annually in Ridgecrest since 1995, representing less than 5% of the total cases recorded in Kern County (KCDPH 2008).

**Worker Safety Table 3**
**Valley Fever Cases In Kern County 1995-2008**

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kern County Cases | 523 | 382 | 307 | 328 | 504 | 406 | 994 | 1,055 | 1,281 | 1,540 | 1,578 | 1,081 | 1,229 | 1,128 |
| Rate per 100,000 | 84.5 | 61 | 48.3 | 51.2 | 77.1 | 61 | 145.7 | 150.9 | 177.7 | 206.9 | 204.9 | 135.2 | 150.4 | 135.1 |

Source: KCDPH 2008, Table 1

**Worker Safety Figure 3**
**VF Cases in Kern County 1995-2008**




Source: KCDPH 2008, Figure 2

During correspondence with Dr. Michael MacLean of the Kings County Health Department, he noted that according to his experience and of those who study VF, it is very hard to find the fungus in soil that was previously farmed and irrigated, which greatly reduces the risk of infection resulting from disturbance of farmed lands. This does not apply to previously undisturbed lands where excavation, grading, and construction may correlate with increases in VF cases. Dr. MacLean feels that with the current state of knowledge, we can only speculate on the causes and trends influencing VF cases and he does not feel that construction activities are necessarily the cause of VF outbreaks (KCEHS 2009).

Valley Fever is spread through the air. If soil containing the fungus is disturbed by construction, natural disasters, or wind, the fungal spores become airborne and are thus available for inhalation by people. The disease is not spread from person to person. Occupational or recreational exposure to dust is an important consideration. Agricultural workers, construction workers, or others (such as archeologists) who dig in the soil in the disease-endemic area of the Central Valley are at the highest risk for the disease (CDC 2006; CDHS 2010). The risk for disseminated coccidioidomycosis is much higher among some ethnic groups, particularly African-Americans and Filipinos. In these ethnic

groups, the risk for disseminated coccidioidomycosis is tenfold that of the general population (CDC 2006).

A VF website claims that most cases of valley fever do not require treatment. Even though 30-60% of the population in areas where the disease is highly prevalent — such as in the southern San Joaquin Valley of California — have positive skin tests indicating previous infection, most were unaware of ever having had valley fever ("Valley Fever Vaccine Project of the Americas" 2010).

**Worker Safety Table 4**
**Disease Forms**

| Categories | Notes |
|---|---|
| Asymptomatic | • Occurs in about 50% of patients |
| Acute Symptomatic | • Pulmonary syndrome that combines cough, chest pain, shortness of breath, fever, and fatigue.<br>• Diffuse pneumonia affects immunosuppressed individuals<br>• Skin manifestations include fine papular rash, erythema nodosum, and erythema multiforme<br>• Occasional migratory arthralgias and fever |
| Chronic Pulmonary | • Affects between 5 to 10% of infected individuals<br>• Usually presents as pulmonary nodules or peripheral thin-walled cavities |
| **Extrapulmonary/Disseminated Varieties** | |
| Chronic skin disease | • Keratotic and verrucose ulcers or subcutaneous fluctuant abscesses |
| Joints / Bones | • Severe synovitis and effusion that may affect knees, wrists, feet, ankles, and/or pelvis<br>• Lytic lesions commonly affecting the axial skeleton |
| Meningeal Disease | • The most feared complication<br>• Presenting with classic meningeal symptoms and signs<br>• Hydrocephalus is a frequent complication |
| Others | • May affect virtually any organ, including thyroid, GI tract, adrenal glands, genitourinary tract, pericardium, peritoneum |

Given the available scientific and medical literature on Valley Fever, it is difficult for staff to assess the potential for VF to impact workers during construction and operation of the proposed Calico Solar Project with a reasonable degree of certainty. However, the higher number of cases reported in Kern County indicates that the project site may have an

elevated risk for exposure, despite the fact that the Ridgecrest area itself has recorded less than 15 cases per year since 1995. To minimize potential exposure of workers and also the public to coccidioidomycosis during soil excavation and grading, extensive wetting of the soil prior to and during construction activities should be employed and dust masks should be worn at certain times during these activities. The dust (PM10) control measures found in the Air Quality section of this SA/DEIS should be strictly adhered to in order to adequately reduce the risk of contracting VF to less than significant. Towards that, staff proposes Condition of Certification **WORKER SAFETY-7** which would require that the dust control measures found in proposed Conditions **AQ-SC3** and **AQ-SC4** be supplemented with additional requirements.

## Proposed Project Fire Hazards

During construction and operation of the proposed Calico Solar Project there is the potential for small fires, major structural fires and wildland fires. Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, insulating fluid at the project power plant switchyard or flammable liquids, explosions, and overheated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely at power plants. Fires and explosions of natural gas or other flammable gasses or liquids are rare. Compliance with all LORS will be adequate to ensure protection from all fire hazards associated with the project. Wildland fires that would use local vegetation as its fuel and could have potential effects on workers and project facilities are not expected to be caused by the project. If wildland fires are external to the Calico Solar Project boundaries, they would not be the responsibility of the project owner to suppress. However, the applicant plans to remove all vegetation in the vicinity of the solar power towers, substation and administration areas, and to cut and maintain vegetation in the solar field. The access road along the perimeter fence lines will also serve as a fire break.

Staff reviewed the information provided in the AFC to determine if available fire protection services and equipment would adequately protect workers, and to further determine the project's impact on fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the SBCFD (which is staffed under joint authority with CalFire).

### Construction

During construction, portable fire extinguishers will be located and maintained throughout the site; safety procedures and training will also be implemented (SES 2008a).

### Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended NFPA standards (including Standard 850, which addresses fire protection at electric generating plants), and all Cal-OSHA requirements. Fire suppression elements in the proposed plant will include both fixed and portable fire extinguishing systems.

The fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water would be stored in the 175,000 gallon demineralized water storage. A diesel fire water pump will increase the water pressure to the level required to serve all fire fighting systems. The applicant has proposed a number of protective measures that would help reduce the potential for harm to plant personnel and damage to facilities. These include removal of all vegetation in the vicinity of the solar power towers, substation and administration areas. The access road along the perimeter fence lines would also serve as a fire break.

In addition to the fixed fire protection system, smoke detectors, flame detectors, high-temperature detectors, appropriate class of service portable extinguishers, and fire hydrants must be located throughout the facility at code-approved intervals. These systems are standard requirements of the fire code, NFPA and staff has determined that they will ensure adequate fire protection.

The applicant would be required by conditions of certification **WORKER SAFETY-1** and**-2** to provide a final fire protection and prevention program to both staff and the SBCFD prior to the construction and operation of the project in order to confirm the adequacy of proposed fire protection measures.

### Emergency Medical Services Response

A statewide survey was conducted by staff to determine the frequency of incidents requiring emergency medical services (EMS) for natural gas-fired power plants in California. The purpose of this analysis was to determine what impact, if any, power plants might have on local emergency services. Staff has concluded that incidents at power plants that require EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to power plants shows that many of the responses for cardiac emergencies involved non-work related incidences, including visitors. The need for prompt response within a few minutes is well documented in the medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site defibrillator often called an Automatic External Defibrillator or AED; the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for many private and public locations including airports, factories, and government buildings, all of which maintain on-site cardiac defibrillation devices. Therefore, staff concludes that with the availability of modern cost-effective AED devices, it is proper in a power plant environment to maintain these devices on-site in order to treat cardiac arrhythmias resulting from industrial accidents or other non-work related causes. Therefore, an additional condition of certification, **WORKER SAFETY-5**, is proposed so that a portable AED will be located on site, and workers trained in its use.

## C.15.4.3 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) LEVEL OF SIGNIFICANCE

**Cumulative impacts and mitigation**

Staff reviewed the construction and operation of the Calico Solar Project could have on the fire and other emergency service capabilities of the SDCFD. Staff concludes that the Calico Solar Project would have a cumulative significant impact on existing local services.

**Noteworthy public benefits**

Staff has not identified any noteworthy public benefits associated with the proposed project's potential use of fire and emergency service capabilities of the SBCFD.

## C.15.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage alternative would essentially be a 275 MW solar facility located within the central portion of the proposed 850 MW project. It was developed because it could be constructed without the necessity of a new 500 kV transmission line, and would avoid several other environmental impacts. This alternative's boundaries and the revised locations of the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 1**.

## C.15.5.1 SETTING AND EXISTING CONDITIONS

The general setting and existing conditions would remain as described in C.15.4.1 although the land requirements would be proportionately reduced to reflect the smaller project size. Locations of laydown areas may also vary.

## C.15.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The types of construction and operational impacts of this alternative would be the same as those of the proposed project, as described in Section C.15.4.2. The proposed project impacts are found to be less than significant with the incorporation of conditions of certification, and impacts of this alternative would be even smaller due to the smaller extent of construction disturbance and the smaller number of SunCatchers of the alternative. Construction and operation risk to workers due to the use of hydrogen and use of herbicides will be reduced because of the reduced number of SunCatchers.

## C.15.5.3 CEQA LEVEL OF SIGNIFICANCE

Like the proposed project, the construction and operation of the reduced acreage alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of worker safety and fire protection with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the reduced acreage alternative would be the same as that proposed for the proposed project (staff recommended conditions **WORKER SAFETY-1** to **WORKER SAFETY-6**).

## C.15.6 AVOIDANCE OF DONATED AND ACQUIRED LANDS ALTERNATIVE

The Avoidance of Donated and Acquired Lands Alternative would be an approximately 720 MW solar facility located within the boundaries of the proposed 850 MW project. This alternative, the transmission line, substation, laydown, and control facilities are shown in **Alternatives Figure 2**.

### C.15.6.1 SETTING AND EXISTING CONDITIONS

The general setting and existing conditions would remain as described in C.15.4.1 although the land requirements would be proportionately reduced to reflect the smaller project size. Locations of laydown areas may also vary.

### C.15.6.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The types of construction and operational impacts of this alternative would be the same as those of the proposed project, as described in Section C.15.4.2. The proposed project impacts are found to be less than significant with the incorporation of conditions of certification, and impacts of this alternative would be even smaller due to the smaller extent of construction disturbance and the smaller number of SunCatchers of the alternative. Construction and operation risk to workers due to the use of hydrogen and use of herbicides will be reduced because of the reduced number of SunCatchers.

### C.15.6.3 CEQA LEVEL OF SIGNIFICANCE

Like the proposed project, the construction and operation of the 720 MW alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of worker safety and fire protection with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the 720 MW alternative would be the same as that proposed for the proposed project (staff recommended conditions **WORKER SAFETY-1** to **WORKER SAFETY-6**).

## C.15.7 NO PROJECT/NO ACTION ALTERNATIVES

There are three No Project / No Action Alternatives evaluated as follows:

**No Project / No Action Alternative #1: No Action on the Calico Solar Project application and on CDCA land use plan amendment**

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Staff concludes that if the applicant for the proposed Calico Solar Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by proposed **WORKER SAFETY** conditions of certification; the Calico Solar Project would incorporate sufficient measures to ensure

adequate levels of industrial safety and comply with applicable LORS. As worker safety and fire protection is a LORS-conformity requirement, the No Project/No Action alternative consideration is not applicable to the worker safety topic and thus there would be no significant impacts on the local fire department.

No Project / No Action Alternative #2: No Action on the Calico Solar Project and amend the CDCA land use plan to make the area available for future solar development

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Staff concludes that if the applicant for the proposed Calico Solar Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by proposed **WORKER SAFETY** conditions of certification; the Calico Solar Project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. As worker safety and fire protection is a LORS-conformity requirement, the No Project/No Action alternative consideration is not applicable to the worker safety topic and thus there would continue to a significant impact on the local fire department if another solar project were built at this site.

No Project / No Action Alternative #3: No Action on the Calico Solar Project application and amend the CDCA land use plan to make the area unavailable for future solar development

Under this alternative, the proposed Calico Solar Project would not be approved by the CEC and BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Staff concludes that if the applicant for the proposed Calico Solar Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by proposed **WORKER SAFETY** conditions of certification; the Calico Solar Project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. As worker safety and fire protection is a LORS-conformity requirement, the No Project/No Action alternative consideration is not applicable to the worker safety topic and thus there would be no significant impacts on the local fire department.

## C.15.8 PROJECT-RELATED FUTURE ACTIONS – WORKER SAFETY AND FIRE PROTECTION

This section examines the potential impacts of future transmission line construction, line removal, substation expansion, and other upgrades that may be required by Southern California Edison Company (SCE) as a result of the Calico Solar Project. The SCE

upgrades are a reasonably foreseeable event if the Calico Solar Project is approved and constructed as proposed.

The SCE project will be fully evaluated in a future EIR/EIS prepared by the BLM and the California Public Utilities Commission. Because no application has yet been submitted and the SCE project is still in the planning stages, the level of impact analysis presented is based on available information. The purpose of this analysis is to inform the Energy Commission and BLM, interested parties, and the general public of the potential environmental and public health effects that may result from other actions related to the Calico Solar Project.

The project components and construction activities associated with these future actions are described in detail in Section B.3 of this Staff Assessment/EIS. This analysis examines the construction and operational impacts of two upgrade scenarios

- The **275 MW Early Interconnection Option** would include upgrades to the existing SCE system that would result in 275 MW of additional latent system capacity. Under the 275 MW Early Interconnection option, Pisgah Substation would be expanded adjacent to the existing substation, one to two new 220 kV structures would be constructed to support the gen-tie from the Calico Solar Project into Pisgah Substation, and new telecommunication facilities would be installed within existing SCE ROWs.
- The **850 MW Full Build-Out Option** would include replacement of a 67-mile 220 kV SCE transmission line with a new 500 kV line, expansion of the Pisgah Substation at a new location and other telecommunication upgrades to allow for additional transmission system capacity to support the operation of the full Calico Solar Project.

## C.15.8.1 ENVIRONMENTAL SETTING

The environmental setting described herein incorporates both the 275 MW Early Interconnection and the 850 MW Full Build-Out options. The setting for the 275 MW Early Interconnection upgrades at the Pisgah Substation and along the telecomm corridors is included within the larger setting for the project area under the 850 MW Full Build-Out option, which also includes the Lugo-Pisgah transmission corridor.

Fire support services along the SCE transmission upgrades would be under the jurisdiction of the San Bernardino County Fire Department (SBCFD) and fire suppression support nearby to the Pisgah Substation and the Calico Solar Project would come from the Newberry Springs Fire Department and the SBCFD. The San Bernardino County Fire Department has an estimated response time of 40 minutes and will provide primary fire protection, fire fighting, and emergency response services (SES 2008a). SBCFD North Desert Division Harvard Station #46 (39059 Kathy Lane in Newberry Springs) is 30 miles from the ending point of the transmission upgrades site near Pisgah Substation, and would be the first responder to that area. Station #46 has a one ICS Type 1 structure engine, one ICS Type 4 Brush Patrol unit with 4-wheel drive, and one Type 3 Brush Fire Engine. It has three staff on duty at all times (a captain, and two paid-call firefighters) (SBCFD 2010). The SBCFD North Desert Division also has eight stations in the area between the Lucerne Valley and I-15 in Hesperia that would

be able to provide fire suppression along the southwestern portion of the line in the more developed area near Lugo Substation.

In San Bernardino County, hazardous material incidents are handled by the San Bernardino County Interagency Response Team, which is composed of hazardous materials specialists from San Bernardino County and participating city fire agencies. There are over 100 members (15 Registered Environmental Health Specialists and the rest, firefighters), and the organization is a full Level A response team capable of handling all types of chemical, biological, radiological, and nuclear responses. Hazardous materials service for the County is headquartered in the City of San Bernardino and the County is divided into three geographic regions for the purpose of deploying hazmat trained fire service personnel and vehicles and equipment in close proximity to any incident (SBCFD 2010).

## C.15.8.2 ENVIRONMENTAL IMPACTS

Industrial environments are potentially dangerous during both construction and operation. The construction activities would include the pre-permitting surveying of the transmission line route and substation expansion areas, the actual construction activities, and the existing line decommissioning activities. For construction of the transmission line towers, accidents can occur during transport of equipment and supplies to the project area, during drilling of the transmission tower foundations, during welding and construction of the tower components, and during overhead work activities on the tower structures. The conductor stringing activities also requires transport of equipment to the project area, vehicle and equipment usage, overhead work activities, and work activities in the vicinity of live high voltage electric lines. The line decommissioning activities would have similar potential for accidents, due to transport of equipment and supplies to the project area, equipment usage, vehicle travel, overhead work activities, and work activities in the vicinity of live high voltage electric lines.

Workers at the project site would be exposed to loud noises, moving equipment, trenches, and confined space entry and egress. Workers may sustain falls, trips, burns, lacerations, and other injuries. They may be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks or electrocution. Worker safety impacts can also be caused by vehicle accidents associated with operation of heavy equipment or travel accidents to and from or within the project area. It is important that SCE has well-defined policies and procedures, training, and hazard recognition and control to minimize these hazards and protect workers. If the project complies with all LORS, workers would be adequately protected from health and safety hazards.

During construction and operation of the upgrades there is the potential for both small fires and major structural fires. Electrical sparks; combustion of fuel oil, hydraulic fluid, mineral oil, insulating fluid at the substations, or flammable liquids; explosions; and overheated equipment may cause small fires. Major structural fires are unlikely along transmission lines and at substations. Fires and explosions of flammable gasses or liquids are rare. Compliance with all LORS would be adequate to ensure protection from all fire hazards.

The project would rely on both on-site fire protection systems and local fire protection services. The on-site fire protection system would provide the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the SBCFD.

## C.15.8.3 MITIGATION

SES included the following general recommended mitigation measures for worker safety in Appendix EE of the AFC:

- Adherence to appropriate OSHA safety standards;
- Utilization of applicable permits for all work activities and compliance with permit conditions;
- Preparation and utilization of appropriate traffic control plans;
- Training for all project employees and contractors on job hazards, personnel protective equipment (PPE), and hazard reporting; and
- Preparation of appropriate health and safety plans for each specific work area, monitoring of the implementation of the plan, and modification of the plan as necessary based on work conditions and safety performance.

Mitigation similar to the Conditions of Certification in the **Worker Safety and Fire Protection** of this Staff Assessment/EIS that would require SCE to provide a project construction safety and health program and a project operations and maintenance safety and health program are recommended.

To ensure the safety of workers and the public, SCE has stated that safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

In mountainous areas, benching may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. It would be used minimally to help ensure the safety of personnel during construction activities.

Construction of the project and construction equipment may impede emergency access through the area. Recommended mitigation would require SCE to coordinate construction schedules, lane closures, and other activities associated with installation of the project with emergency and police services to ensure minimal disruption to response times and access for these services. As is discussed in the **Transportation and Traffic** section of this Staff Assessment/EIS, because guard structures would be installed over roadway crossings such impacts would also be reduced. Therefore, impacts to emergency access and/or public services and facilities would be less than significant.

## C.15.8.4 CONCLUSION

Incorporation of the measures discussed above and the Conditions of Certification included in the **Worker Safety** section of this Staff Assessment/EIS would ensure adequate levels of industrial safety and would comply with applicable LORS. This Staff Assessment/EIS also concludes that the project would not have significant impacts on local emergency and fire protection services.

## C.15.9 CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code Regulation, Title 14, section 15130). NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7).

There is the potential for substantial future development in the San Bernardino Valley area and throughout the southern California desert region. Analysis of cumulative impacts is based on data provided in the following maps and tables (see **Cumulative Scenario**):

- **Cumulative Impacts Figure 1**, Regional Renewable Applications;
- **Cumulative Impacts Figure 2**, Renewable Applications in the Barstow & Needles District Areas;
- **Cumulative Impacts Figure 3**, Newberry Springs/Ludlow Area – Existing and Future/Foreseeable Projects;
- **Cumulative Impacts Table 1**, Renewable Energy Projects in the California Desert District
- **Cumulative Impacts Table 2**, Existing Projects in the Newberry Springs/Ludlow Area; and
- **Cumulative Impacts Table 3**, Future Foreseeable Projects in the Newberry Springs/Ludlow Area.

The analysis in this section first defines the geographic area over which cumulative impacts related to waste management could occur. The cumulative impact analysis itself describes the potential for cumulative impacts to occur as a result of implementation of the Calico Solar Project along with the listed local and regional projects.

### Geographic Extent

Cumulative impacts can occur within San Bernardino County if implementation of the Calico Solar Project could combine with those of other local or regional projects. Cumulative impacts could also occur as a result of development of some of the many proposed solar and wind development projects that have been or are expected to be under consideration by the BLM and the Energy Commission in the near future. Many of these projects are located within the California Desert Conservation Area, as well as on BLM land in Nevada and Arizona.

The geographic extent for the analysis of the cumulative impacts associated with the Calico Solar Project includes San Bernardino County. This geographic scope is appropriate because of the solar facilities existing and proposed for San Bernardino County.

## Cumulative Impact Analysis

### Local and Regional Projects

For this analysis, there are two existing solar projects in the area or region that may require the response from off-site fire departments for fire, HazMat, or EMS emergencies: SEGS at Kramer Junction and at Harper Lake, both located in the far western part of San Bernardino County at least one hour distance from the proposed Calico Solar Project. However, these facilities are not considered by staff to have had an impact on the area or on the existing capabilities of the SBCFD.

Staff has analyzed the potential for Worker Safety/Fire Protection cumulative impacts at many other power plant projects in California. A significant cumulative Worker Safety/Fire Protection impact is defined as the simultaneous need for a fire department to respond to multiple locations such that its resources and those of the mutual aid fire departments (which routinely respond in every-day situations to emergencies at residences, commercial buildings, and heavy industry) are over-whelmed and cannot effectively respond. Staff believes that cumulative impacts are possible and that despite the many safeguards implemented to both prevent and control fires, HazMat releases, and injuries/accidents at solar power plants, the great distances involved in the desert and the many solar plants that are proposed for San Bernardino County all may cause a significant cumulative impact. Staff therefore believes cumulative impacts on the local fire department would be significant. If staff's proposed mitigation as described in Condition of Certification **WORKER SAFETY-6** is adopted, the impact to the SBCFD would be mitigated to less than significant.

### Cumulative Impact Conclusion

Impacts of the Calico Solar Project would combine with impacts of past, present, and reasonably foreseeable projects to result in a contribution to local and regional cumulative impacts related to worker safety and fire protection.

The need for off-site emergency services for the Calico Solar Project would add to the total burden of the San Bernardino County Fire Department due to the number of new solar power plants proposed for this region and the great distances involved in responding to emergencies. Response to an emergency at one solar power plant leaves a station vacant for an extended period of time and thus increases the response time to other locations. Staff finds that this project may have a significant cumulative burden on the SBCFD's ability to respond to a fire or medical emergency and recommends mitigation in the form or proposed Condition of Certification **WORKER SAFETY-6** to reduce this impact to less than significance.

## C.15.10 COMPLIANCE WITH LORS

Staff concludes that if the applicant for the proposed Calico Solar Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by proposed **WORKER SAFETY** conditions of certification; the Calico Solar Project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. As worker safety

is a LORS-conformity requirement, the No Project/No Action alternative consideration is not applicable to the worker safety topic.

## C.15.11 NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits associated with Worker Safety and Fire Protection.

## C.15.12 FACILITY CLOSURE

Upon final facility closure, no workers will remain at the site, except for those necessary to maintain security over any remaining hazardous materials until they are removed from the site. During decommissioning, worker safety would be ensured by the same CAL-OSHA and other regulations requiring safety plans and training for as were needed for construction and operations. A decommissioning **Illness and Injury Prevention Plan** would be included as part of the decommissioning plan.

Facility fire protection systems will remain functional while hazardous materials remain on site, and as long as feasible into the decommissioning process.

## C.15.13 PROPOSED CONDITIONS OF CERTIFICATION

**WORKER SAFETY-1** The project owner shall submit to BLM's authorized officer and the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- a Construction heat stress protection plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring The Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the BLM's authorized officer and the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the San Bernardino County Fire Department for review and comment prior to submittal to the CPM for approval.

**Verification:** At least thirty (30) days prior to the start of construction, the project owner shall submit to the BLM's authorized officer and the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the San Bernardino County Fire Department

stating the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

**WORKER SAFETY-2** The project owner shall submit to BLM's authorized officer and the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- an Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);
- a Best Management Practices (BMP) for the storage and application of herbicides;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, the Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment Program shall be submitted to the BLM's authorized officer and to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the San Bernardino County Fire Department for review and comment.

**Verification:** At least thirty (30) days prior to the start of first-fire or commissioning, the project owner shall submit to BLM's authorized officer and the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to BLM's authorized officer and the CPM from the San Bernardino County Fire Department stating the Fire Department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

**WORKER SAFETY-3** The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;

- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety 1 and 2 are implemented.

**Verification:** At least thirty (30) days prior to the start of site mobilization, the project owner shall submit to BLM's authorized officer and the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

The CSS shall submit in the Annual Compliance Report documentation of monthly safety inspection reports to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

**WORKER SAFETY-4** The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in Worker Safety 3, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

**Verification:** At least thirty (30) days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to BLM's authorized officer and the CPM for review and approval.

**WORKER SAFETY-5** The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on-site whenever the workers that they supervise are on-site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to BLM's authorized officer and the CPM for review and approval.

**Verification:** At least thirty (30) days prior to the start of site mobilization the project owner shall submit to BLM's authorized officer and the CPM proof that a portable AED

exists on site and a copy of the training and maintenance program for review and approval.

**WORKER SAFETY-6** The project owner shall either (1) reach an agreement with the San Bernardino County Fire Department regarding funding of its project-related share of capital costs to provide appropriate equipment as mitigation of project-related impacts on fire protection, HazMat, and/or EMS services along with an annual payment to maintain and provide these services, **or**, if no agreement can be reached shall (2) fund its share of the capital costs in the amount of $350,000 plus provide an annual payment of $100,000 to the SBCFD for the support of additional fire department staff commencing with the date of site mobilization and continuing annually thereafter on the anniversary until the final date of power plant decommissioning.

**Verification:** At least 30 days prior to the start of site mobilization, the project owner shall provide to the BLM's authorized officer and the CPM either a copy of the agreement or documentation that the $350,000 payment and the first annual payment has been made.

In the annual compliance report submitted to the CPM, the project owner shall provide documentation that the annual payment has been made unless an agreement is reached with the KCFD that an annual payment is not required.

**WORKER SAFETY-7** The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:

i) site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;

ii) site monitoring for the presence of Coccidioides immitis in soil before site mobilization and monthly thereafter; and

iii) Implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4**) immediately whenever visible dust comes from or onto the site.

After three consecutive months of not finding significant soil levels of Coccidioides immitis, the project owner may ask the BLM's authorized officer and the CPM to re-evaluate and revise this testing requirement.

**Verification:** At least 60 days prior to the commencement of site mobilization, the enhanced Dust Control Plan shall be provided to the BLM's authorized officer and the CPM for review and approval.

## C.15.14 CONCLUSIONS

Staff concludes that if the applicant for the proposed Calico Solar Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by conditions of certification **WORKER SAFETY -1**, and **-2**; and fulfills the requirements of conditions of certification **WORKER SAFETY-3** through **-7**, Calico Solar would incorporate sufficient measures to ensure adequate

levels of industrial safety and comply with applicable LORS. Staff also concludes that the proposed project would have cumulative significant impacts on local fire protection services but that implementation of proposed Condition of Certification **WORKER SAFETY -6** would reduce those impacts to less than significant.

Staff further concludes that none of the project alternatives would materially or significantly change potential impacts form the project with regard to worker safety or fire protection. None of the alternatives would be preferred to the proposed project or reduce any otherwise significant impacts on worker safety or fire protection.

## C.15.15 REFERENCES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